THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

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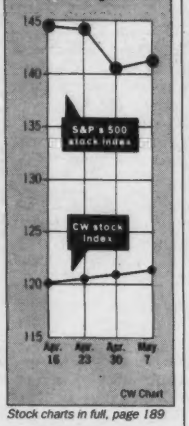

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Early users of the IBM Token-Ring network find products and information scarce. **Page 13.**

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Users rate Applied Data Research's new release of Ideal. **Page 45.**

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AT&T's Starlan fares well with early users who eagerly await gradual addition of features. **Page 19.**

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Foreign-made PC clones can be a bargain, but can also pose problems. **Page 35.**

■

Lotus Development Corp. will roll out a comprehensive set of customer agreements within six weeks, President Jim Manzi promised last week at the company's annual meeting. New sales, service and support arrangements will affect all customers, not just large corporate buyers, he said.

■

Just weeks after an aborted merger with 3Com Corp., forced vacations without pay are pending at Convergent Technologies, sources say. "It wouldn't surprise me, particularly on the AT&T side," John Girton, analyst at Birr Wilson & Co. in San Francisco, said in response to the reports. Convergent has pointed to a drop

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Burroughs targets Sperry

Users favor merger, expect broader service, technology

By Douglas Barney

A poll of Burroughs Corp. and Sperry Corp. users by *Computerworld* last week found a majority of those questioned in favor of the proposal to merge the companies.

More than half of the 40 users surveyed indicated they believe the combined computer companies would provide a greater array of technology, better service and more competition for IBM.

Others, particularly Sperry users, feared that the merger could have a negative impact by reducing the commitment to product lines currently in use.

In last week's survey, 21 users were in favor of the merger, 11 were opposed and eight were undecided.

See **USERS** page 7

Union of mainframe rivals aims to blunt IBM's lead

By Alan Alper and Clinton Wilder

NEW YORK — A bid to create the world's second largest computer company remained on hold late last week with Sperry Corp. declining to respond to an offer by Burroughs Corp. to acquire its New York-based mainframe rival for $70 per share.

Burroughs, making its second attempt within 12 months to combine the two traditional BUNCH companies, said it had begun acquiring Sperry shares in a so-called hostile takeover.

If successful, the $4.1 billion acquisition would represent the most drastic restructuring of the mainframe industry in a decade. The merged entity would pull far

See **UNION** page 6

NAS boasts line outguns Sierra

By Jeffry Beeler

MOUNTAIN VIEW, Calif. — Claiming performance gains of up to 80% over IBM's most powerful system, National Advanced Systems Corp. last week announced two multiple-processor mainframe additions to its AS/XL family.

The two machines, aimed at customers such as banks and large retailers with rapid growth in processing volume, are said to offer 40% and 80% throughput advantages over IBM's 3090 Model 400.

NAS also introduced an entry-level CPU that the company characterized as basically a degraded version of its previously announced 3090-compatible uniprocessor,

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Support charges irk Wang users

By Donna Raimondi

Wang Laboratories, Inc.'s new software support plan, set to be implemented on July 1, has longtime customers grumbling. The users say they want proof that Wang's historically haphazard software services will be improved before they agree to pay for them.

The Wang Software Services program will require users to pay for services that have heretofore been provided free.

"They were giving it away, and all of a sudden they have started to charge money for it," says Charles Raudonis, director of research and development at Fidelity Mutual Life Insurance Co. in Radnor, Pa.

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CW EXCLUSIVE

Trailblazers: A hardy few set out in search of LU6.2 riches

By Eddy Goldberg

When it comes to pursuing the goal of peer-to-peer, multivendor connectivity promised by IBM's Logical Unit 6.2 communications protocol, nearly every major user has the same thing to say:

"You first."

Though managers within the roughly two dozen DP shops surveyed by *Computerworld* maintain that they are seriously considering and definitely planning to use LU6.2, most are waiting for someone else to be the pioneer.

One person not willing to wait is Joseph T. Brophy, senior vice-president of data processing at the Travelers Insurance Cos. in Hartford, Conn., who thinks LU6.2 should greatly facilitate office automation. "We're pretty excited about it," he says. "It's a standard architecture, so a lot of hardware and software vendors can develop products and fill in niches in IBM's product line — and let us get on with the job of automating the office."

Brophy

IBM introduced LU6.2 in July 1982. Also called APPC, for Advanced Program-to-Program Communication, LU6.2 provides users with protocols for peer-to-peer communication, allowing applications programs on dissimilar processors to communicate with each other as peers.

Though IBM software support for LU6.2 is still limited, many users are willing to wait for its promise to be delivered in usable products.

"When you have a breakthrough like this, you're pleased. So what if you have to wait a year or two? When it becomes available, we'll be there," says George DiNardo, executive vice-president of the information management and research department at Mellon Bank, N.A. in Pittsburgh.

"For IBM, LU6.2 is a direction statement," DiNardo says. "They have nothing yet, but if LU6.2 produces

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NEWSPAPER

IBM users group at age 30: Toasting past, looking ahead

Guide comes of age, changes with time

By James Connolly

PEORIA, Ill. — Finding better ways to recognize emerging technologies and to share information about the changing DP environment are key goals for a powerful IBM users group as it marks its 30th anniversary this year.

Guide International Corp., which derived its name from Guidance for Users of Integrated Data Processing Equipment, was founded by representatives of 44 IBM 702/705 user organizations in December 1956. In an interview last week, Guide President John E. Nack reported that the organization now has 2,800 member companies and organizations, with each running an IBM 4300 or larger system. Nack discussed the ways Guide has changed, its future and its relationship with IBM.

"We have come of age a bit in recognizing that we are an information exchange service. We thought for a period of time that we were not, or we tried not to be. We were trying to be a group of people who got together and worked on projects and brought requirements to IBM," Nack said. But, he said, Guide also found that many people were joining the organization in search of a chance to exchange knowledge.

John Nack, Guide president

"In the last few years we have decided that we also are an information exchange vehicle," Nack noted.

Guide wants to concentrate in the future on providing a format for that exchange, rather than solely trying to influence IBM, according to Nack, who is in his third year as Guide president and is a manager with Caterpillar Tractor Co. in Peoria.

Three major conferences

Guide holds three major conferences a year, including one in Chicago the week of July 13. Much of the work at those conferences will continue to be done through the independent project format, under which groups of 10 to 40 members take a two-year-long look at a technology or product before issuing white papers for the information of other members and issuing recommendations to help steer IBM in its product development, Nack said.

Guide now has 180 projects running and has a data base of several thousand user requirements for IBM's consideration. Those projects address topics such as the strengths and weaknesses of IBM products in areas like in-house publishing and VM security software requirements. Each project team meets several times per year, listening to presentations by IBM representatives, conducting roundtable discussions and meeting with users experienced with a product or technology.

Nack estimated that Guide has a success rate of better than 90% in getting IBM to address user suggestions.

During the past two years, IBM has started to acknowledge Guide's input by briefly mentioning in new product literature that a product or enhancement is intended to address a particular Guide requirement.

"We have a good interchange with IBM, particularly early in the life of a product with the product developers, so I believe that there is an opportunity for both IBM to shape our opinion of the product and for us to shape IBM's opinion of the product. I think an awful lot of that goes on," Nack said.

IBM listens

He also said that it is natural for IBM to listen carefully to established groups like Guide. Guide was established for the benefit of commercial DP operations rather than the scientific, engineering and educational organizations that were the founders of the other 30-year-old IBM user group, Share.

"When we gather our collective voices on an issue and we say that this is a Guide issue, then IBM should take that into consideration. We represent 2,800 of their largest users," he said.

Nack observed that Guide is changing in more ways than in the information-sharing area. "In order to be a viable user organization, we are going to have to tune the membership requirements to the reality of the world. If the reality of the world becomes that there are relatively fewer large glass houses and relatively significant increases in the numbers of System/36s on down, and those are the folks who want to come to our meeting, then we are going to have to allow some changes in our membership requirements.

"I really think what you are going to see happen is that organizations like ourself have to tune up to different sets of requirements based on the kinds of services we are trying to provide," he said.

Nack noted that one example of how the structure is changing is the addition of Guide divisions that address the telecommunications and end-user computing areas.

"For instance, my telecommunications division might — and I have to say 'might' — in order to be effective, require a different set of membership requirements than the operating systems group on account of the fact that I am dealing with an entirely different set of problems," he said.

"There would be no reason, perhaps, in the future to exclude somebody who is a PBX user but does not happen to use an IBM mainframe, if what you are trying to do with the communications division is have a project that works on PBXs," Nack continued. "The IBM/Rolm acquisition makes that an even more interesting circumstance for us."

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ILLUSTRATIONS ON PAGES ONE AND 17 BY ALAN WITSCHONKE

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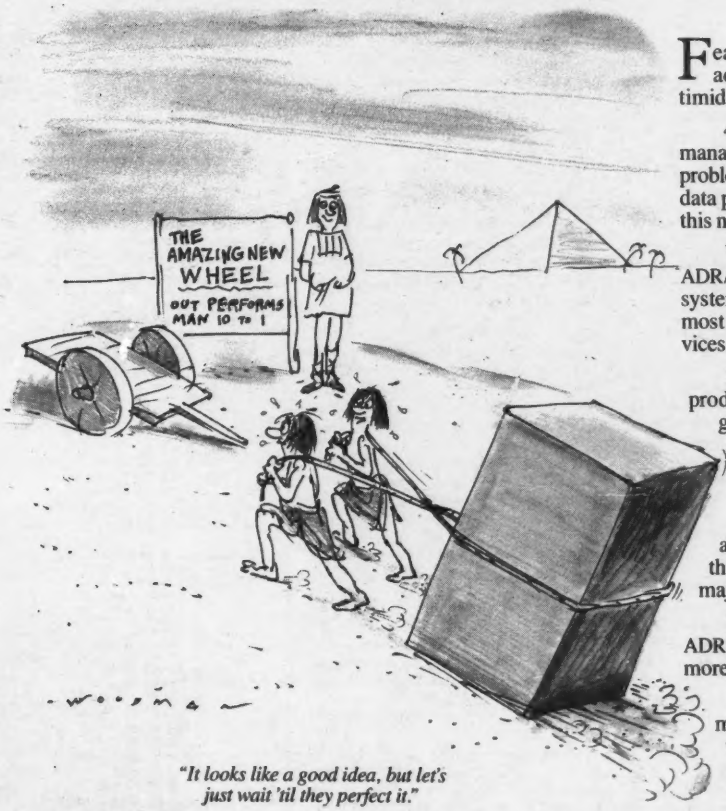

"It looks like a good idea, but let's just wait 'til they perfect it."

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Data General laptop offers hard-disk option

But not using dealers may be 'big mistake'

By David Bright

NEW YORK — Data General Corp., which experienced weak demand for its first laptop computer, last week introduced an upgraded, IBM PC-compatible version with an optional 10M-byte internal hard disk drive and improved displays.

The Data General/One Model 2 system, priced from $1,795, is the first laptop from a major computer vendor with an integral 10M-byte hard disk drive and an electroluminescent display.

While analysts gave the DG/One Model 2 high marks, they warned that DG must quickly establish its marketing presence. AT&T, Compaq Computer Corp. and Wang Laboratories, Inc. are all expected to bring out hard disk-equipped laptops later this year.

Initially plagued by engineering difficulties such as displays that customers claimed could barely be read, the DG/One, introduced in September 1984, has so far achieved sales of no more than 15,000 units. That is less than half of the initial industry expections for the system, estimated Larry Lefkowitz, microcomputer group associate editor at Datapro Research Corp. of Delran, N.J.

DG's introduction of the less than 12-lb Model 2 system follows by one month the debut of IBM's PC Convertible, which carries a base price of $1,995. Analysts believe DG may have a hard time selling the laptop outside of the firm's existing customer base, especially since the system will not be sold through dealers.

"They've got a window of three to four months that will ultimately dictate how successful they are in this market," said John McCarthy, research manager at Forrester Research, Inc., Cambridge, Mass.

McCarthy said that DG's decision not to sell the laptop through dealers is "a big mistake" and that, in the face of 30% volume discounts offered by IBM, DG will have to discount the system heavily to volume buyers.

One drawback with the DG/One Model 2 is the external battery pack required for the electroluminescent models.

With the new system, users have a choice between the 25 line electroluminescent display and an improved LCD. The electroluminescent display costs an extra $1,000.

An LCD version of the DG/One Model 2 sells for $1,795, with 256K bytes of memory and one 3½-in. floppy disk drive. A basic system with serial and parallel ports and a built-in battery and charger is $1,995. With a 10M-byte hard disk, the LCD version's price moves to $2,995.

An electroluminescent model with one floppy, a 10M-byte hard disk drive and 640K bytes of memory costs $4,635. Options include an internal 1,200/300 bit/sec. modem for $450 and a second serial port for $195.

A two-drive DG/One system is now priced at $1,495. The new LCD screen is available as an upgrade to existing DG/One systems.

NAS boasts line outguns Sierra

From page 1

the AS/XL 60. Prices for the AS/XL 50, 90 and 100 start at about $3.1 million, $9.8 million and $12.4 million, respectively.

The four-processor AS/XL 100 provides 2.9 to 3.4 times more performance than the AS/XL 60 uniprocessor, which roughly equals the power of IBM's 3090 Model 200. The three-processor AS/XL 90 outperforms the AS/XL 60 by a factor of 2.4 to 2.7, according to Carl Claunch, the vendor's director of worldwide systems planning.

Both the AS/XL 90 and AS/XL 100 exceed the internal throughput of the AS/XL 80, NAS' previous top-of-the-line mainframe, which corresponds to the 3090 Model 400. The AS/XL 80 is 70% to 90% faster than the AS/XL 60, Claunch said.

The entry-level AS/XL 50, a 3090 Model 180-class machine, runs 20% to 40% slower than the AS/XL 60, Claunch said.

The announcement of the three AS/XL models came only about two weeks before NAS is scheduled to begin shipping the AS/XL 60 and AS/XL 80, which were introduced in March 1985.

Shipments of the AS/XL 50 are scheduled to begin during the first quarter of 1987, with the AS/XL 90 and AS/XL 100 to follow two quarters later.

Most powerful CPUs

NAS officials described the AS/XL 90 and AS/XL 100, which are still under development at Hitachi Ltd., as the most powerful IBM-style CPUs yet conceived.

Each of NAS' Sierra-class mainframes can be upgraded in the field to the family's next largest member, NAS officials said.

NAS user John Cook, vice-president of computer operations at Concord, Calif.-based Central Bank reacted indifferently to the introductions. "I really know very little about the announcement, but judging from what I've just heard, I'd say the most important feature of the products is their increased horsepower," he said. "But who cares? Everyone is assuming that any time now, some more powerful machines will also be coming from IBM."

Some other users, however, greeted last week's announcement positively. "I suspect very-high-end customers might be extremely interested in the new NAS products," said John Kline, director of information services at Dayton, Ohio-based Mead Corp.

The main difference between the various AS/XL models is the way their hardware building blocks are combined. Two AS/XL 60s, when tied together, yield an AS/XL 80. An AS/XL 90 consists of an AS/XL 60 coupled with an AS/XL 80 and the largest of the five systems combines two AS/XL 80s.

A minimum AS/XL 50 configuration comes with 32M bytes of main memory and 16 channels, expandable to 128M bytes and 48 channels. A basic AS/XL 90 and AS/XL 100 combines 128M bytes of internal storage with 48 channels and expands to a maximum of 512M bytes and 96 channels.

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TOP OF THE NEWS

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in business from AT&T as one reason behind revenue declines.

■

More acquisitions could be in store at Management Science America, Inc. (MSA), company President William Graves told investors at a Hambrecht & Quist conference in San Francisco last week.

MSA is currently sitting on approximately $100 million in cash, which will be reduced to $80 million with the recent acquisitions of RTS Ltd. in Dublin and Information Associates, Inc. of Rochester, N.Y. "We could do another two or three acquisitions like Information Associates this year," Graves said.

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Sperry faces the fate of mainframe dinosaurs GE and RCA

Burroughs clawing for No. 2 position

By James Connolly

ANALYSIS

There was a time when the logos of General Electric Co. and RCA Corp. were attached to more than the consumer goods, such as televisions, for which they are best known. Each made mainframe computers, and each, like Burroughs Corp. and Sperry Corp., saw IBM chew up their market share.

Now Sperry faces the same fate that the computer divisions of GE and RCA encountered in 1970 and 1971 — the prospect of being absorbed by another computer maker. In RCA's case, the acquirer was Sperry. In GE's case, Honeywell, Inc. absorbed a failing venture.

The desire to regain its No. 2 position from Digital Equipment Corp. by building a $10 billion company is driving Burroughs' pursuit of Sperry.

In one way, Burroughs Chairman W. Michael Blumenthal's second attempt to absorb Sperry makes sense. As members of the BUNCH group of mainframe vendors, Burroughs and Sperry have seen their market share slip, particularly in comparison to IBM. It seems logical that somebody has to do something to slow the erosion of the non-IBM base.

According to estimates by the market research group International Data Corp. (IDC), IBM's U.S. shipments of large systems soared from $1.7 billion in 1981 to $6.8 billion last year, while Burroughs' shipment figures edged up from $400 million to $450 million and Sperry's figures fell from $450 million to $350 million.

A recent *Computerworld* survey of a half-dozen users of BUNCH-member NCR Corp. equipment turned up three who had jumped to IBM, while calls to 20 Sperry user sites last week revealed that seven had gone to IBM.

But other than providing a united front to fight IBM — a front that would be built on incompatible processor lines — questions remain about the acquisition.

IDC analyst Don Bellomy says, "It does not make sense except as Blumenthal's attempt to get out of the BUNCH and into the 'BID' — Burroughs, IBM and DEC." He says he doubts a combined unit could provide the product line or profit figures to justify a merger.

Bellomy points to Honeywell's gradual phasing out of the GE product line, and adds, "If I were a Sperry customer with a sense of history, I would be a little concerned."

He notes that while Blumenthal promised to maintain the Sperry product line — in an era when companies like DEC are emphasizing compatibility — there is no guarantee that Blumenthal's eventual successor will honor that promise.

Last week's survey of users revealed a general feeling of support for the merger. But some users, particularly Sperry customers, voiced doubts.

Those Sperry customers seemed concerned their systems may get tossed aside when it comes to support and development. Those customers might be worried because they have seen Sperry make a commitment to Unix-based systems and Burroughs largely steer clear of Unix.

While those fears are not unsubstantiated, some observers were noting last week that the more likely scenario would be continued support for Sperry's 1100 line of mainframes and a gradual migration of Sperry customers into a common architecture.

If that happens, most customers probably will cope. But the name of Sperry, which has already replaced the venerable name Univac, will fade into the background with other failed mainframe names like GE, RCA and Xerox Data Systems.

Sperry and Burroughs:
Worldwide shipments and installed bases

	Large Systems	Medium-Scale Systems	Small Systems
Burroughs Corp. 1985 shipments (millions of dollars)	820	690	670
Installed Base	1,340	4,920	52,000*
Sperry Corp. 1985 shipments (millions of dollars)	630	390	230
Installed Base	990	3,430	19,000*

* Figure excludes other vendors' products sold under OEM agreements. Installed base figure would at least double if those small systems were counted, according to International Data Corp. estimates.

Information provided by IDC May 1986 estimates.

Union aims to blunt IBM's lead

From page 1

ahead of the other BUNCH companies with some $10.5 billion in revenue. But it would be saddled with two highly incompatible large-system product lines.

Burroughs Chairman W. Michael Blumenthal said last week his proposal to acquire Sperry is intended to enhance the competitiveness of both firms against IBM.

"It is a move, the beginning of a process, to create another viable U.S. multinational advanced computer manufacturer and marketer to challenge the market leader," Blumenthal said.

Blumenthal emphasized that if the merger is approved, both firms' sales organizations and distinct mainframe architectures — Sperry's 1100 series and Burroughs's A and V series — would be preserved.

But most observers believe the merger makes little sense unless the new company develops a single computer architecture to which both Burroughs and Sperry users can migrate. "You can eliminate some redundancies on Day 1, but to really see the benefit, you have to have a unified product line in the five- to seven-year time frame," said mergers and acquisitions specialist Harvey Poppel of Broadview Associates in Fort Lee, N.J.

The creation of an alternative to IBM, Blumenthal said, would eliminate "the fear factor in the purchase of computers." Many potential users of non-IBM equipment are reticent to commit to anyone but Big Blue, he said.

Burroughs made an earlier merger offer last June, but withdrew it when Sperry objected to various elements of the plan. Sperry's hesitancy in responding to the offer last week led analysts to anticipate it would fight the Burroughs takeover attempt.

To remain independent, Sperry would have to repurchase its outstanding shares, a development believed to be unlikely given the huge expense entailed. Sperry would have to sell one of its business units to raise the money needed.

"The customer would suffer if Sperry, in the process of trying to remain independent, weakens its financial structure," Poppel said.

Rumors had circulated last week that Sperry had considered a long list of potential "white knight" partners, or firms that could make a tender offer to compete with the $70 a share Burroughs bid. Sperry stock rose above the $70 mark on the speculation and on anticipation that Burroughs might up its offer.

The Burroughs offer, which was $5 per share higher than its unsuccessful bid last June, consisted of 55% in cash and the balance in Burroughs' preferred stock and debt securities.

This time, Burroughs did not wait to be rejected and moved to take matters into its own hands.

A source inside Sperry said that despite past acquisition passes made by Burroughs, ITT and others, last week's proposition "caught us with our pants down." The source likened the acquisition offer to a military operation where surprise is the key to success.

Blumenthal indicated that despite mainframe product line overlap there is much that is complementary between the two firms. While Sperry is strong in scientific and government markets, Burroughs has a huge installed base in the financial services sector.

By combining certain operational activities the merged firm would obtain substantial cost reductions through greater economies of scale, Blumenthal said. In the first year of operation, the combined firm could save $150 million, he estimated.

Some analysts took issue with Blumenthal's cost savings analyses. "It's not like at General Motors where you have Chevy and Pontiac under the same roof and can use the same engine in each," said Donald Haback of Smith Barney, Harris Upham & Co. "There's little commonality of parts in the mainframe business."

William Easterbrook of Kidder, Peabody & Co. remarked that Blumenthal could easily obtain the cost savings he projected through plant consolidations and layoffs. "That's something he doesn't want to talk about until the deal is done," Easterbrook said.

Because of the huge expense of the acquisition, analysts said that a newly created corporation would be carrying an excessive amount of debt. Standard & Poor's Corp. placed the debt securities ratings of both Burroughs and Sperry on its credit watch list.

"With that debt, I think Blumenthal's got quite a challenge," said George Podrasky, an analyst with Duff & Phelps, Inc. in Chicago.

AT A GLANCE

Burroughs

- Established as American Arithmometer Co., 1886
- Reorganized as Burroughs Adding Machine Co., 1905
- Built memory device for ENIAC, 1952
- Acquired computer maker, Electrodata, 1956
- Acquired System Development Corp., 1980
- Acquired Memorex Corp., 1982

Fiscal year 1985 (ended Dec. 31)
Revenue: $5.03 billion
Profits: $248 million
Assets: $4.55 billion
Employees: 60,500
Foreign subsidiaries: 27

AT A GLANCE

SPERRY

- Established, 1933
- Merged with Remington Rand Corp., developer of Univac I, to become Sperry Rand, Inc., 1955
- Acquired RCA Corp. computer customer base, 1971
- Changed name to Sperry Corp., 1979

Fiscal year 1986 (ended March 31)
Revenue: $5.74 billion
Profits: $47 million
Assets: $5.9 billion
Employees: 65,932
Foreign subsidiaries: 33

Merger could challenge IBM or mire new giant in debt

By Clinton Wilder

What kind of $10 billion company would result from the marriage of Burroughs Corp. and Sperry Corp.?

Burroughs Chairman W. Michael Blumenthal foresees a resource-rich hybrid with both the muscle and the marketing presence to compete with IBM in the mainframe world.

But other observers predict a debt-saddled giant unable to capitalize on synergy because of incompatible computer architectures, warring management and clashing corporate cultures. And the hostile nature of Burroughs' acquisition bid is certainly not going to help the marriage.

"The key is whether two companies that have viewed each other as competitors can suddenly be made to feel warm about each other," said Harvey Poppel of Fort Lee, N.J.-based Broadview Associates.

Kroger

"The major element is two very strong, distinct cultures," Poppel added. "The middle and upper-middle management are career Burroughs people. Sperry was a pioneer in the business, and most of its people have also been there their entire careers."

The fate of Sperry's top management within the new company, notably Chairman and CEO Gerald Probst and President and Chief Operating Officer Joseph Kroger, would be very uncertain. Their opposition to Burroughs, particularly Kroger's, was considered the major obstacle to the merger last year, and Sperry's refusal to comment last week seemed to indicate its management is still strongly opposed to losing its independence.

Blumenthal

Blumenthal said he saw a role for Sperry management in the combined firm but stopped short of saying whether there was room for Probst or Kroger. "I won't speak about individuals; it's hardly appropriate," he said.

Probst

Charles Varga of The Cerberus Group, Inc. in Frenchtown, N.J., a firm that tracks merger and acquisition activity, said "anywhere from 10,000 to 20,000 jobs" could be eliminated by the combination of the two companies.

Correspondent Alan Alper contributed to this story.

Users favor firms' merger

From page 1

On the whole, Burroughs' users expressed more optimism, and Sperry users expressed more concern about the proposed merger.

"Burroughs wouldn't want two financial software products, and its package is considered more advanced than Sperry's," said Jim Helfer, assistant vice-president of systems and programming for Coral Gables Federal Savings & Loan Association based in Miami, Fla. "So there could be some pressure for us to convert to the Burroughs system."

A majority, 21 users, said they believe the merged company would be better able to meet their own future processing needs. A similar number, 24, said the combination would be more competitive..

Many users view size as the major benefit. "They will have a broader footing, including a larger sales and field engineering force," said Steve Main, DP manager for the diversified firm Hopper, Inc. in California.

One user expects the combination to have more of an impact upon Digital Equipment Corp. than on IBM. "They'll be coming at the lower end of the market, and that is going to cut into DEC more than IBM," said Robert Poirier, director of operations for Floral Network, Inc. in Chicago.

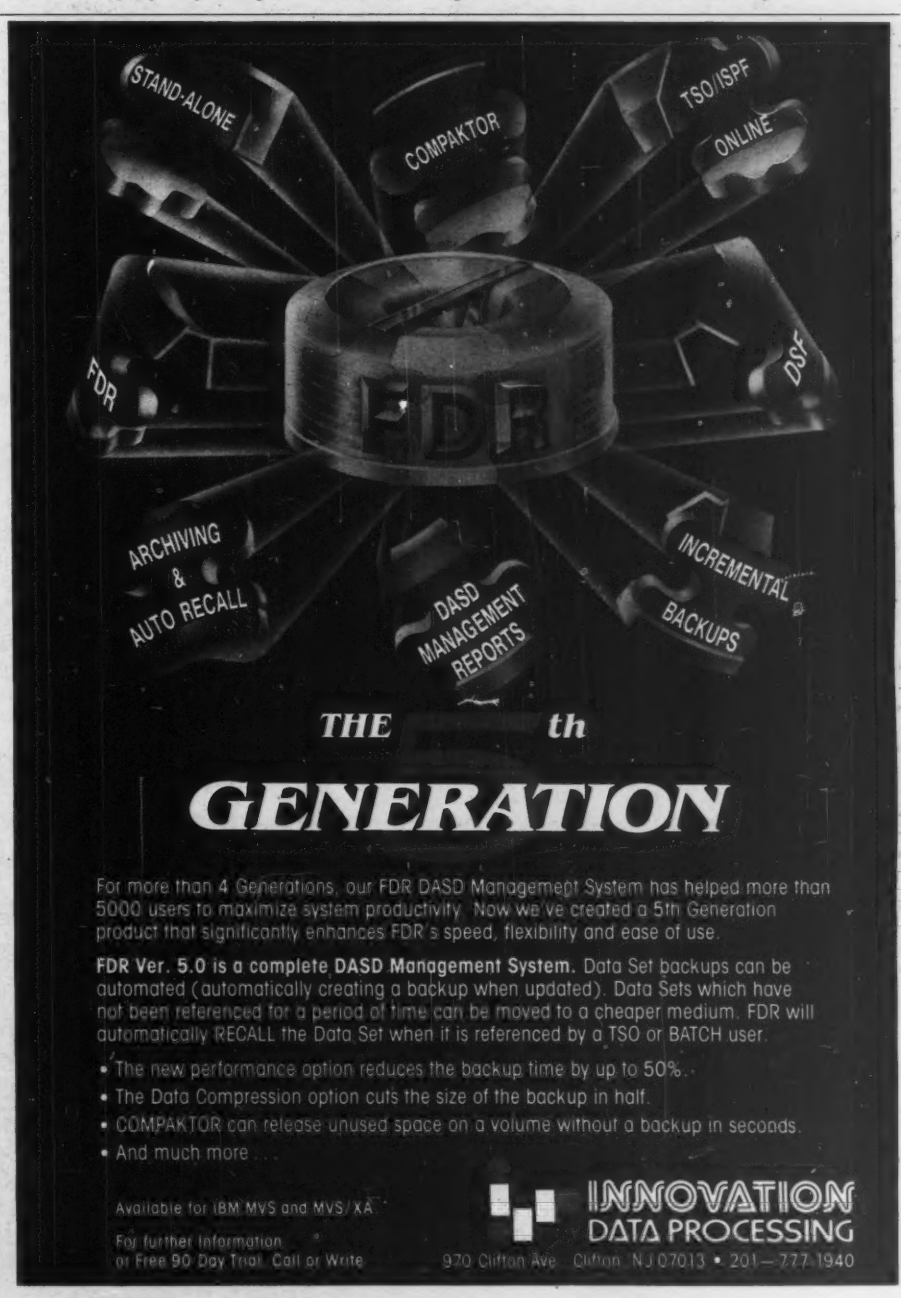
Critics of the merger fear that a battle for corporate control, as well as the complicated process of combining the firms, will reduce the short-term commitment to customer service and product development.

"They may get too big too fast and fall flat on their faces," said Davy McClary, operations manager, Indiana Lumbermans Mutual, based in Indianapolis.

Thirty respondents expressed confidence that their systems will not be abandoned as a result of the merger, and seven were concerned that their systems might be abandoned.

"I really don't see how such diverse operating systems and machines can merge successfully," said Kirk N. Cobb, director of MIS for Munford, Inc., an Atlanta-based operator of convenience stores and a Burroughs user.

Contributing to this report were staff members Rosemary Hamilton, Mitch Betts and James A. Martin.



Harris to launch Unix-based processor line

Target: DEC hold on general-purpose mart

By James Connolly

FORT LAUDERDALE, Fla.— Seeking to expand its customer base beyond the aerospace and defense markets into the general-purpose Unix market, Harris Corp.'s Computer Systems Division today is scheduled to announce four supermicrocomputers and superminicomputers.

The Harris MCX-3 and MCX-5 lines are targeted at the low-end and middle of Digital Equipment Corp.'s VAX product line. Built around the Motorola, Inc. 68020 microprocessor, the MCX-3 and MCX-5 are intended to fill out the Unix-based processor series that Harris introduced a year ago with the HCX-7. The CX Series is aimed at computer-aided design, civil engineering, electrical engineering and software engineering.

Harris claimed performance figures of 1.5 million instructions per second (MIPS) for the basic CPU and 3.6 MIPS for each CPU with a floating-point accelerator. The MCX line includes the single-processor MCX-3 Model 40, the single- or dual-processor MCX-3 Model 60, the single- or dual-CPU MCX-5 Model 60 and the two- to four-CPU MCX-5 Model 70.

Harris' Director of Product Marketing Rick Maule said, "The incumbent out there is DEC, and that is who we are going after. As they lay down each of their cards, we want to lay down one of ours." He positioned the HCX-7 line against DEC's VAX 8600, the MCX-3 against DEC's Microvax and the MCX-5 against DEC's mid-range 8200 and 8300.

He said along with the expansion of the CX line, Harris will continue to enhance its earlier H-Series of superminis and Harris Station Series workstations.

Another Harris official, Vice-President for Marketing Robert Mitro, said the keys to Harris' ability to expand its market include the ability to offer high-performance systems for each level, adherence to standards such as Unix, efforts to build a national support system modeled after that of IBM and the continued adaptation of third-party application software source code for its systems.

He said Harris wants its scientific and engineering customers to make more general use of Harris systems, citing as an example the U.S. Corps of Engineers' running data base applications as well as engineering applications on Harris equipment.

Expanding from traditional market

Sandra Gant, an analyst with Infocorp of Cupertino, Calif., noted that Harris has been a sleeper in the supermini marketplace. "I think they can leverage from their traditional market into other areas. But there are some noble competitors out there who will not sit still," she said.

International Data Corp. analyst David Moschella added, "They are good at what they do, and they are right for the markets they are in. Harris traditionally has had good products, but they have had trouble getting outside of those government markets."

Maule said that Harris went outside of the company for much of the technology for the MCX Series, acquiring the 32-bit CPU boards and backplane cluster from Masscomp before adding its own packaging and peripherals. The HCX-7 uses a Computer Consoles, Inc. processor.

The basic MCX processor is the pedestal-style MCX-3 Model 40, which consists of two printed circuit boards with a 16.7-MHz 68020 and room for a Motorola 68881 floating-point processor. It offers an 8K-byte cache memory, a 12M byte/sec. memory bus and up to 10M bytes of main memory and supports up to 12 users with optimal performance, Maule said. The Model 40 costs $18,700.

At the high end of the MCX Series, the cabinet-version MCX-5 Model 70 provides up to four processors and supports up to 64 users in high-performance applications such as real-time simulation, according to Harris. The Model 70 supports 4G bytes of virtual address space per process, 128M bytes of physical address space and 32M bytes of memory. It costs $73,000.

IBM software ties PC to host

IBM last week introduced the PC/Host File Transfer and Terminal Emulator Program, a software offering that links IBM Personal Computers asynchronously to Systems Network Architecture (SNA) hosts through an IBM 3708 Network Conversion Unit or 3710 Network Controller.

The $200 package is the first designed for PC-to-host access through the 3708 and 3710 devices, an IBM spokesman said.

The 3708 and 3710 were designed to allow protocol conversion between ASCII and Synchronous Data Link Control environments. "We look at them as important links in some network chains where both environments exist," the spokesman said.

Linked to an MVS, VM or VSE/SNA host, the PC/Host software gives PC users full screen 3270 terminal emulation and file transfer capability, IBM said. This is done in protocol conversion mode with the 3708 or 3710, according to the company. That mode also permits a single communications line to support both display and printer capabilities.

PCs also can emulate a 3101 terminal and attach to the 3708 or 3710 in protocol enveloping mode. This gives access to asynchronous applications on the SNA host or to an asynchronous host.

— Eric Bender

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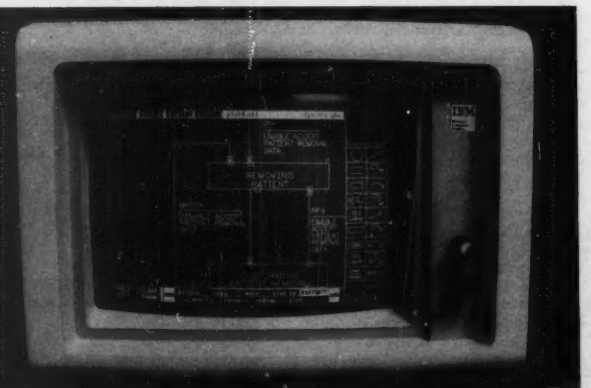

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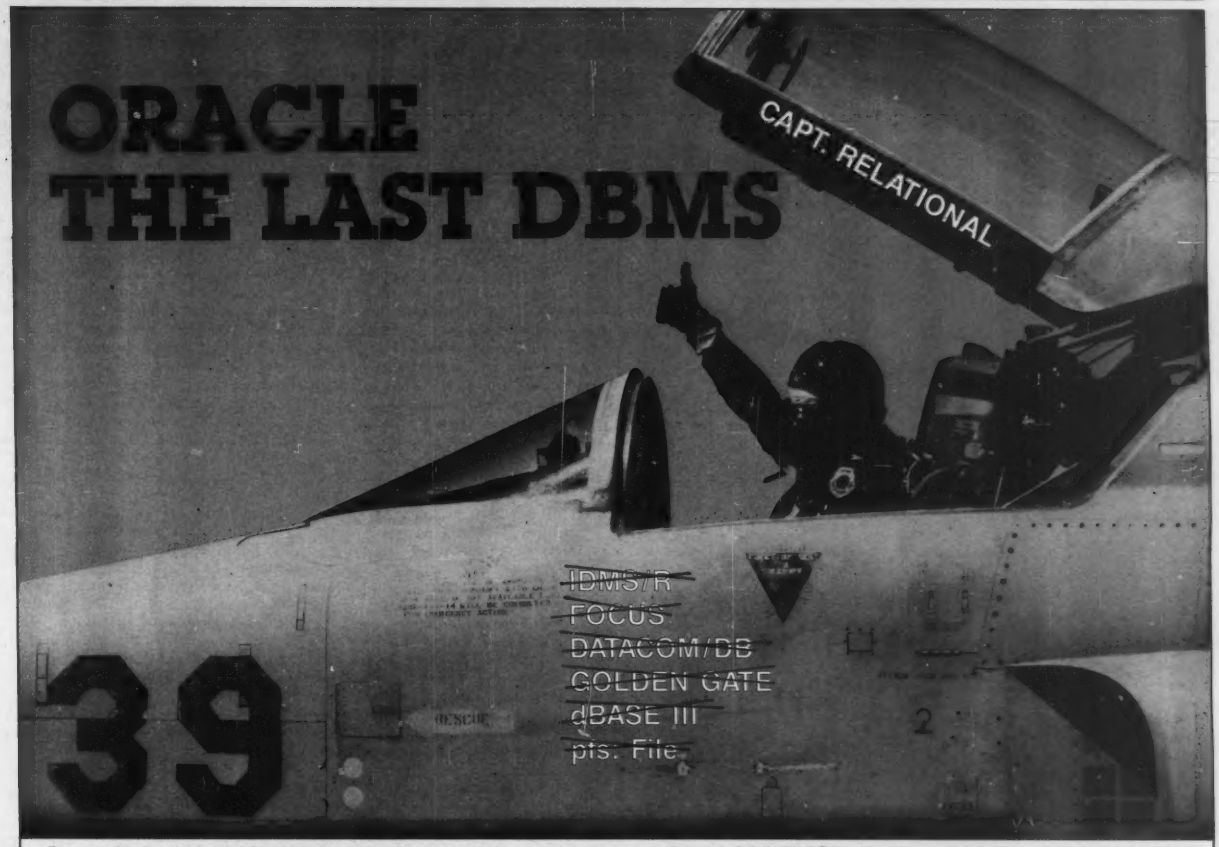

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Support charges irk Wang users

From page 1

research and development at Fidelity Mutual Life Insurance Co. in Radnor, Pa. "We have 30 sites across the country, so it is going to cost us a pretty good chunk of change."

The plan is not unlike what other vendors such as IBM and Digital Equipment Corp. offer, but Wang users have been disappointed by past experiences and say they are unwilling to accept the program. Ironically, the current controversy comes at a time when Wang had been concentrating extra effort on improving its traditionally spotty customer service efforts.

Raudonis' sentiment was echoed by Wang users in other parts of the country. "Wang support wasn't that good to begin with, and now they want us to pay for it," says an indignant customer with two dozen OIS systems in the Northeast.

The Wang Software Services program is a three-tier plan that company officials say will provide operating system and application software updates automatically, a monthly software maintenance bulletin, telephone support and, if necessary, on-site maintenance (see story below). By July 1, customers who have not registered for the plan will have to pay for software support services on a time and materials basis.

Wang's traditional problems in the software service arena are close to legendary. In fact, Dr. Wang's re-emergence as the controlling force at Wang was sparked, in part, by these shortcomings.

"If Wang can provide decent service, it would be worth it to the customer to pay for it," says Vincent Flanders, associate editor of *Access 86*, a Wang-specific magazine. "Nobody that I know thinks they can do it," he adds.

"We looked at our competition and found that we were the only major manufacturer who had not done this. We are just getting in step with the competition," explains Raymond Cullen Jr., senior vice-president of Wang's Customer Services Operations.

"We are making an investment in a significant number of analysts who can solve problems," adds Donald Desrochers, Wang's vice-president of operation support. "Before, the customer would have to take the initiative and order the upgrades on his own," Desrochers says. "We did not provide automatic updates or a bulletin on a regular basis."

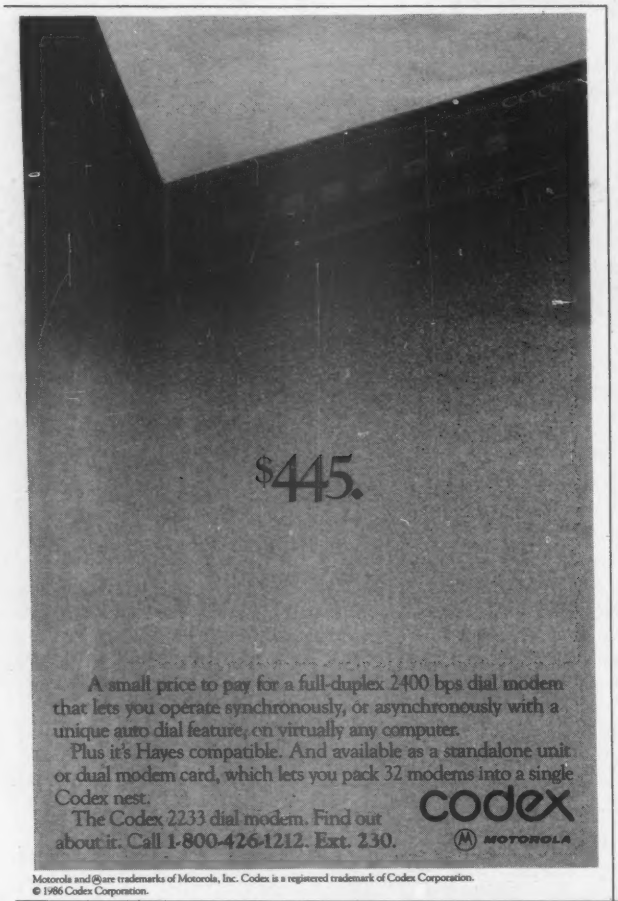
"Wang says, 'all the other companies, like IBM, charge like this,' but I say, 'as soon as I get the kind of service IBM gives, I'll pay that kind of charge,' " says the major Wang user in the Northeast who asked not to be identified. The user will seek proof of Wang's commitment to better service before he decides whether or not to enroll in the plan.

"We have never paid for new software releases before," says Dennis Sweeney, cash manager in Pepsico, Inc.'s treasury department. Pepsico uses Wang word processing machines, and it is "extremely rare" for the company to call Wang on software issues. "I suspect it will be cheaper for us to pay for the upgrades as we need them than to enroll in the plan. That will force us to take a closer look at whether or not we really need upgrades."

Wang will have to prove itself in the software service arena before he feels comfortable about paying for it, Raudonis says. "We don't expect Wang to change all that much. They need better trained technical people on the support staff. The couple of telephone support calls that we have made have not been encouraging. Support is weak, thus far," he adds.

"I don't believe in the past we were prepared to deliver the services the customers were expecting," Desrochers admits. "We are committing to the level of support the customer wants. He will receive assistance and direction, and an escalation process will be apparent to him," he adds.

Three regional support centers created in the past nine months will be the focus of the support services, says Desrochers. By July 1, support services will be fully staffed and trained.



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Three-tiered service offering

Wang Laboratories, Inc.'s new software support contract is composed of three levels of service:

- Subscription Software Service provides automatic updates to the operating system and a monthly software maintenance bulletin.
- Telephone Software Support provides the Subscription Software Service plus telephone support and a remote diagnostic link. The remote link requires that the machine being tested has a Wang personal computer attached.
- Comprehensive Software Support provides the two services mentioned above plus unlimited on-site services as Wang deems necessary.

Charge examples follow:

- A monthly charge of $80 per machine for the Comprehensive Software Support plan on VS 5, 6, 15, 25, 45, 50 and 80 systems; $65 for the Telephone Software Support plan; and $40 for the Subscription Software Service. There are additional monthly charges for application software packages.
- For VS 65, 90 and 100 systems, Comprehensive Software Support costs $140 per month per machine, Telephone Software Support costs $108 and Subscription Software Service costs $70.

— Donna Raimondi

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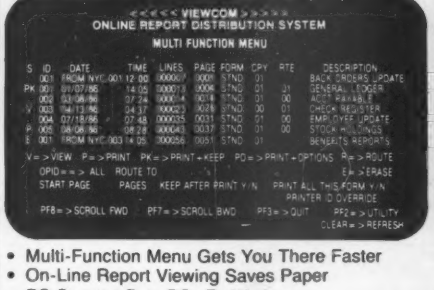

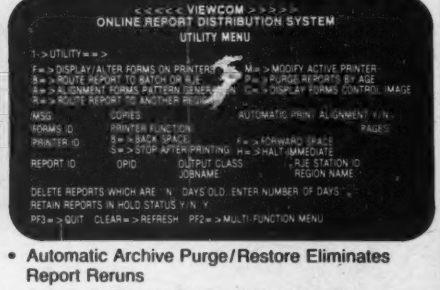

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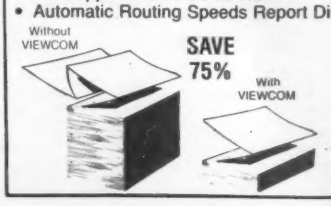

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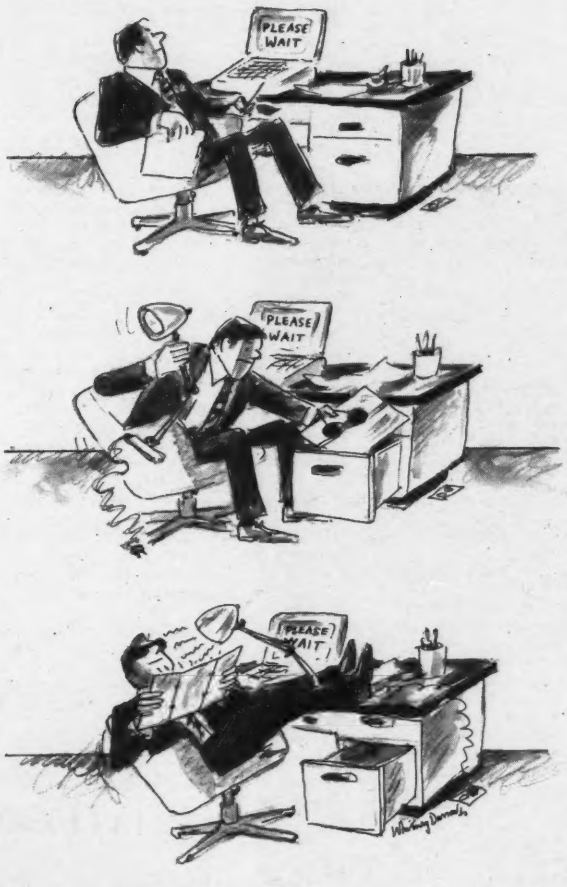

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Trailblazers seek LU6.2 riches

From page 1

a standard interconnect, it represents a tremendous potential."

Although LU6.2 use in production environments is still in its early stages, IBM currently supports it on an increasing number of systems and products, including the System/36 and System/38 and the Token-Ring local-area network. While LU6.2 is supported on CICS, IBM's popular teleprocessing monitor, IBM has yet to announce support for it on IMS, its widely used data base management system.

Major non-IBM computer vendors increasingly are announcing their commitment to provide integrated network connections to Systems Network Architecure (SNA) by incorporating LU6.2 into their own equipment. In fact, LU6.2 support, or the intention to provide it, is increasingly becoming a checklist item for MIS managers planning major hardware purchases.

Brophy welcomes the adoption of LU6.2 by non-IBM system vendors. "We're pretty much an IBM technology shop," he says, "but we want alternatives; not so much in hardware but in software application packages. We'd like to integrate applications on Wang or DEC into our network."

Before more widespread implementation of LU6.2 becomes a reality during the next 12 to 24 months, three hurdles must first be overcome: hardware vendors must implement it on their systems, software developers must become familiar enough with it to write applications and enough "bleeding-edge" pioneers must show that LU6.2 can work in a corporate environment. Only parts of the solution are here today.

"It's just a facility. Once you have it, you've got nothing until you write applications," says Les Moss, senior computer scientist at Citicorp/TTI, a Santa Monica, Calif.-based developer of computer systems for parent company Citicorp. Moss plans to use the LU6.2 protocol to interface a variety of equipment with IBM's SNA environment.

Moss says he would like a standard way of writing applications that communicate with each other, rather than using an ad hoc process every time, and that LU6.2 promises to provide that. "A lot of interface questions are answered in advance with 6.2," he says. For MIS managers considering the pros and cons of LU6.2, Moss says, "It's basically an application development issue. When does he start developing his applications using 6.2?"

At Travelers, where IBM's Token-Ring network is being tested, Vice-President of Telecommunications Trav Waltrip says the company is dealing with the issue of just which applications to rewrite. He says this is a problem all companies will have to confront when implementing LU6.2.

Existing applications

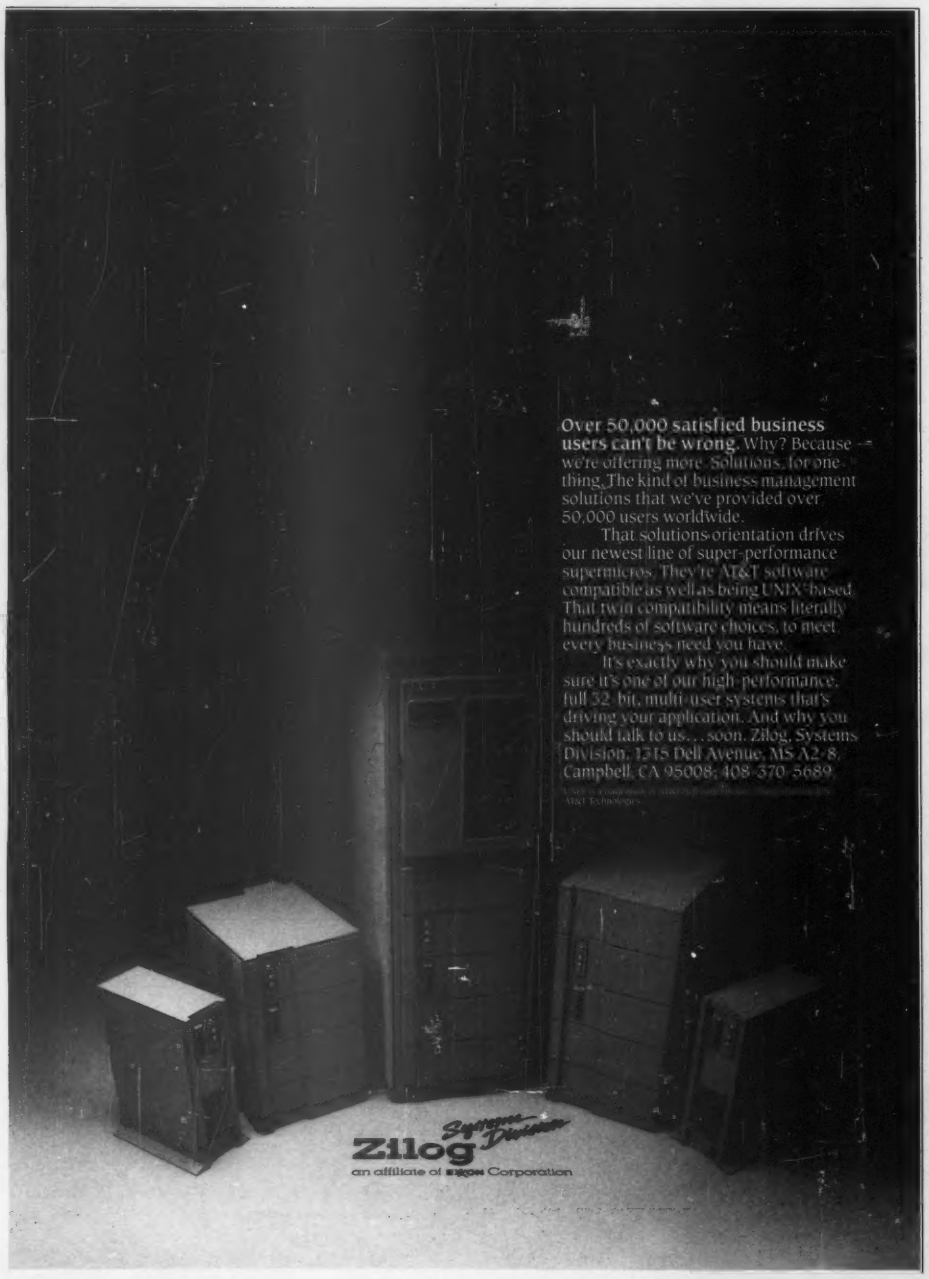
"They'll have applications that were written before LU6.2 and will have to decide if they are going to rewrite them," he points out. In order for existing applications to work on the Token-Ring, he explains, the current LU modules, which deal with telecommunications, must be identified and rewritten.

Choosing which ones to rewrite first is a strategic decision, and not all applications should necessarily be rewritten, Waltrip says. He said Travelers is beginning by rewriting those applications that run under CICS. However, the company has many applications that run under IMS, and until IBM announces LU6.2 support for IMS, there is no plan to rewrite those applications.

Despite many companies' initial uncertainty of the nuts and bolts of LU6.2, Waltrip asserts that "LU6.2 within SNA is the most exciting thing to come along in a long time." He foresees tremendous production gains arising from cooperative processing, with intelligent workstations able to work directly with the host computer.

Another company working with an LU6.2 product is the Fireman's Fund Insurance Co., headquartered in Novato, Calif., which recently in-

See **TRAILBLAZERS** page 15



DP crime bill goes to House

By Mitch Betts

WASHINGTON, D.C. — The Judiciary Committee of the U.S. House of Representatives recently approved an interstate computer crime bill and forwarded it to the full House for a vote within the next few weeks.

The Computer Fraud and Abuse Act of 1986, sponsored by Rep. William J. Hughes (D-N.J.), would for the first time expand federal jurisdiction to computer crimes involving private-sector computers in two or more states [CW, April 28]. The proposal also would make it illegal to traffic in computer passwords belonging to others.

The House Judiciary Committee approved the bill on a voice vote after amending the bill to include securities brokers and dealers in the bill's definition of financial institutions. The bill prohibits computer frauds involving computers used by the federal government and financial institutions as well as computer crimes involving private-sector computers in two or more states.

Hughes said he is confident that the bill will be approved quickly by the full House.

Token-Ring users face product shortage, information lag

Potential buyers await evaluation before purchasing

By Elisabeth Horwitt

IBM is not providing potential customers with enough useful, user-oriented information about its Token-Ring network to make a buying decision, users and consultants say. Although IBM claims volume shipments began in March, several sources report that at this point only major IBM customers have received products.

"IBM needs feedback from users like us in order to better support and train future users of its token network," says Richard Fromm, assistant treasurer at Bankers Trust Co. in New York.

The bank decided to "make a leap of faith" and install IBM's network, despite the lack of user-oriented information, because "we have the internal office systems people that can interpret the low-level technical information IBM supplies," Fromm says.

Other companies without the in-house technical resources of Bankers Trust are unlikely to gain the information they need to make a choice from IBM's "extremely general documentation" or from training courses that "currently are geared to developers and OEMs that will go home and write code," Fromm says.

'Lack of information'

"A lot of our clients are interested in IBM's Token-Ring but still feel they lack the information and hands-on experience to figure out whether the network will work right in their companies' communications environments and meet their application needs," says Nathan Roseman, president of New York network design and consulting company LAN Services, Inc.

The company hopes to provide design, installation and support services for the network but is currently awaiting the delivery of a 25-node system, on order from IBM.

An IBM spokeswoman said that the Token-Ring network became generally available through authorized retailers March 18. Shipment figures were unavailable from IBM.

Companies that have released information about their token-ring plans include Bankers Trust, McKesson Corp. and Travelers Insurance Co. Representatives from Aetna Life & Casualty Co. and United Airlines refused to comment on reports that their companies are making plans to install IBM Token-Ring networks.

Travelers is currently testing four token-ring networks in its computer science and telecommunications departments.

"We decided we would use the 802.5 token-ring standard two years ago, even though no products were available from IBM at the time," Vice-President of Telecommunications Travers Waltrip says.

Expanding net installation

Travelers is expanding its network installation slowly, Waltrip notes, "because of the limited availability of network cards."

"I know of a few managers, mostly in banks, who are ordering IBM's Token-Ring network sight unseen; but they are under political pressure because management believes that the best decision is no decision — that is, to go with IBM," Roseman says.

Bankers Trust was able to get the Token-Ring ahead of most companies, Fromm claims, "because of our strong relationship with IBM. I have to believe that the total number of users is small; at least one dealer I talked to doesn't expect a shipment until June."

The bank chose the Token-Ring net because of its "hardy, open, expandable architecture," reports Lydia Borgatta, who is in charge of advanced workstations for the bank. "We anticipate

See IBM page 14

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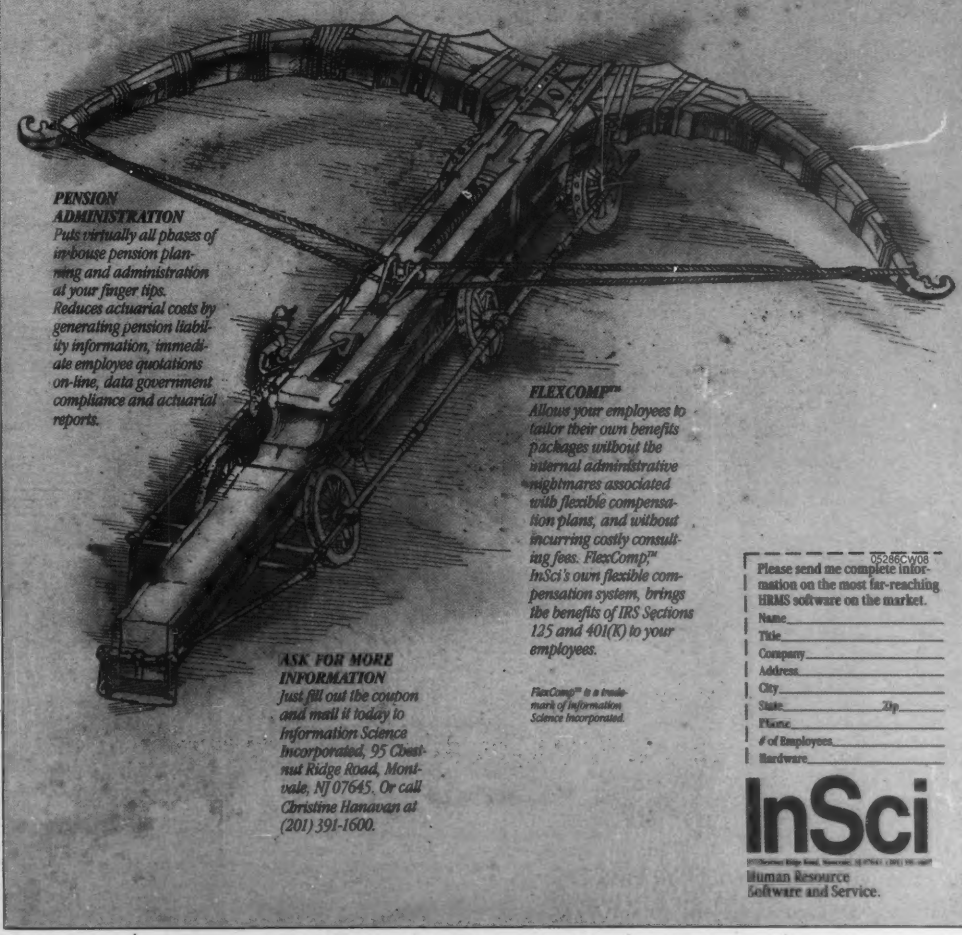

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IBM net users face shortage

From page 13

many third-party manufacturers supplying links to various non-IBM systems."

She adds that she was "encouraged by the number of vendors I saw attending IBM Token-Ring classes at [an IBM training facility at] Raleigh."

Borgatta emphasizes that her group "would not recommend the Token-Ring everywhere in the bank. We are also a very large Decnet shop."

McKesson Corp., a San Francisco-based, $6.3 billion distributor, plans to use token rings to connect an existing installed base of some 100 IBM System/36 machines.

Six weeks ago, the company installed an IBM Token-Ring network connecting 10 IBM Personal Computers and several printers, but its long-term purpose is to connect an existing installed base of some 100 System/36s, according to Vice-President of Technical Services and Telecommunications John Fitzgerald.

McKesson plans to use System/36s as file servers for limited office applications and as gateways to remote sites over a Digital Dataphone Service network, for an installation of approximately 1,000 IBM PCs. "We wanted a low-cost, twisted-pair network," Fitzgerald reports.

The company initially looked at AT&T's Starlan as well as the IBM Token-Ring but chose the latter, partly because "IBM is committed to linking System/36s, and AT&T is more into PBXs," Fitzgerald says.

McKesson also chose IBM's network because, "while AT&T has good physical interfaces, its networking software is not as far along as IBM's LU6.2."

McKesson must wait for several crucial components of its network to become available. IBM has told the company that the 3270 Personal Computer connection should be out by the end of this year, and the System/36 connection, which IBM announced in April, should be available by first-quarter 1987.

In addition to the hardware interfaces to link System/36s to the network, the company needs LU6.2 communications software that will enable System/36s to communicate with mainframe hosts on a peer-to-peer basis, "so the System/36 can initiate and control the dialogue and not always wait for the host," Fitzgerald says.

It may be some time before the software will appear, "but we'd rather wait for someone — preferably IBM — to write the software than do it ourselves," he explains.

"We are looking at a year's worth of evaluation and development before we have our system," Fitzgerald says. "And the total functionality we want is still a year or two away. But at least with IBM, it's a safe bet that we'll have it eventually."

Other companies are not so sure, however. The scarcity of definitive performance data has caused a number of users to hold off on committing to IBM's Token-Ring pending more complete information, Roseman says.

Several of his clients have decided not to bother waiting for IBM and have installed other vendors' token-ring networks, he adds.

LAN Services is currently working with Merrill Lynch & Co. to install a Proteon, Inc. token-ring network running Novell Corp. Netware software at the brokerage company's new headquarters at the World Financial Center in New York. Attempts by *Computerworld* to question Merrill Lynch were unsuccessful.

"Right now, people are deciding whether they want to buy their token rings from us, from 3Com Corp., from Ungermann-Bass, Inc. or from IBM," Proteon Chairman Howard Salwen says.

Network and software vendors that plan to market products that add value to IBM's network say they are disappointed with customer response since the initial IBM announcement.

"We expected the announcement to generate enthusiasm for our future token network products," Bridge Communications, Inc. President William Carrico comments. "But so far, we've had fewer leads than we expected."

Bridge announced this fall that during the first half of this year, it would bring out a series of communications products linking the token-ring net to a variety of workstations as well as to Ethernet.

Cory Casanave, vice-president of software development for Data Access Corp., reports that a few customers have been asking whether the company's networking data base management system, Data Access, can be ported easily from the PC Network to the IBM Token-Ring net.

"We tell them, yes." Casanave says. "I don't believe you can buy the token ring at the store yet," he adds.

> ***The scarcity of definitive performance data has caused a number of users to hold off on committing to IBM's Token-Ring, pending more complete information.***

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The Liquor Control Board of Ontario (LCBO) supervises distribution of alcoholic beverages throughout Ontario and operates over 600 retail outlets. The LCBO is conducting a project to evaluate the potential use of automated Retail and Point-of-Sale (POS) systems in its stores. Current project activity includes pre-qualification of suppliers to identify those who most closely meet the LCBO's requirements.

Pre-qualification will be based on suppliers' responses to a Request for Information (RFI). Evaluation criteria will include supplier strength, retail experience and support mechanisms, and system features such as reliability, documentation and ease of use.

The RFI will be issued on Friday, May 23, 1986, and responses must be received by 5:00 p.m. EDT, Monday, June 9, 1986.

Suppliers who wish to receive the RFI should, by May 21, forward the name, title and full address of the individual to receive the RFI, to:

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Trailblazers seek LU6.2 riches

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stalled IBM's SNA Distribution Service (SNADS). SNADS is an architecture for asynchronous distribution of information between users, implemented as part of IBM's Distributed Office Support System (Disoss). It provides delayed delivery services, eliminating the need for a complete end-to-end session between the originator of a transmission and the destination. Two nodes on a SNADS network exchange data using LU6.2.

Fireman's Fund already had Disoss Version 3 Release 3 in place when it installed SNADS to connect the company's 60 IBM 8100 DPPX systems to Disoss for distributed electronic mail transactions. There are about 1,000 users on the network, most with IBM 3180 terminals. About 100 have IBM Personal Computers (XTs, ATs and 3270 Personal Computers). Plans call for bringing all the company's 12,000 employees into its electronic mail facility.

Why SNADS? "Because we did not want to place all of our electronic mail processing facilities on the host," says Dan Eubanks, programming manager for the Fireman's Fund. "We wanted to use our distributed network for host offloading, for communication line offloading and for local messaging if the host or the lines were not available."

Eubanks says the immediate benefits of using SNADS are better performance for local messaging and less impact on other host applications, since the host is shared with some large IMS applications. As an example, he says, "If a user on one of our distributed 8100s wishes to send a document to another user on that same 8100, it does not have to go to the host and back, which would be the case if he were not a SNADS user."

For users, it simplifies the electronic mail function, since they are not required to know the type of terminal or equipment recipients have; nor do they need to know the location. "They don't need different formats for different users. The system takes care of it," Eubanks says.

However, there still are some obstacles to overcome. LU6.2 enables SNADS users to communicate node to node, but the administration of directories over multiple computer systems is a nettlesome problem for Eubanks. Right now, the sender has to know the receiver's user ID. The master directory resides in Disoss and is transmitted weekly as a document to the users, who can then create their own distribution list.

The difficulty is that as a document, as opposed to a system file, there is no way to incorporate the master directory into the electronic mail system. "There is no good automated solution to that yet," Eubanks regrets. "That's what I'd like to see."

According to Dale Vanosdol, a CICS programmer responsible for electronic mail systems at Cummins Engine Co. in Columbus, Ind., "Having two machines communicate can be very complex. There needs to be a lot of communications intelligence out on the network. We can either look for packages or push the vendors for it."

Execs' pay up 15% from '85

By David A. Ludlum

NEW YORK — Pay for data processing and information management executives is up 15% from last year, with the biggest raises going to systems and communications managers, according to a new survey of 30 blue-chip companies.

The rates of salary growth are the highest reported in the four years that the annual study has been conducted, according to Edward Perlin of Edward Perlin Associates, Inc., which performed the survey.

The average 15% increase in total compensation for data processing and information management executives is more than twice the 6% to 7% average reported in the study last year.

The survey covers more than 1,000 positions at 30 large companies, most of them in banking, insurance and financial services. Annual base salaries for the jobs range from $58,000 to $149,000. Changes are reported for 22 job classifications.

The positions showing the greatest gains in total compensation are system architecture and resource management head (36%), manager of international communications network planning (34%), group head for communications and information management (28%), telecommunications services head (27%) and group head for systems design and development (25%).

Big pay increases for telecommunications managers follow fast growth in demand for executives in that area since the divestiture of AT&T, said Roger O'Connor, a spokesman for Edward Perlin Associates. Knowledge of systems is sought as firms assess the utilization of their systems, he said.

The only positions showing less than 5% growth in total compensation are head of office automation at less than 1% and area head, top position in seniority, at 2%.

The increase for head of office automation is small because the job is being assigned to "lower level people," O'Connor said. The increase for area head is small probably because raises for the position averaged an unusually large 15% to 20% last year, he added.

VIEWPOINT

EDITORIAL

Shotgun marriage

Burroughs Corp.'s proposed takeover of Sperry Corp. has not only raised stock prices but a great many questions as well. Burroughs' chairman, W. Michael Blumenthal, appears determined to consummate the deal, with the avowed hope of creating the world's second largest computer company and a more viable competitor to IBM.

Meanwhile, Gerald Probst, Sperry's chairman, and Joseph Kroger, Sperry's president, seem adamant about their company going it alone, showing little interest in a shotgun marriage.

For good reason. Over the past two years, Probst and Kroger have streamlined and focused Sperry toward its traditional markets and have successfully sought a number of OEM agreements with other U.S. and Japanese vendors.

Blumenthal, however, is undeterred. He spent most of last week arguing that the merger is in the best interests of both companies and their customers, since Sperry offers strength in markets and geographic areas in which Burroughs lacks a presence and Burroughs is strong in areas that have been weak for Sperry.

We question that argument.

What, for instance, will become of each company's product line, from desktops to high-end mainframes? Burroughs executives insist they would remain separate but equal. If so, what is the point of a merger, other than short-term cost savings?

Product integration has been a key to Digital Equipment Corp.'s recent success. It is what users are demanding of IBM. What are users now to make of Burroughs' protestations regarding product independence? Currently, Burroughs and Sperry machines are incompatible and uncomplementary. What systems will be pushed by the newly combined sales force? What impact will that have on years of product development?

Indeed, the more than $4 billion required for Burroughs to complete the merger will certainly cut deeply into available reserves for research and development spending. In an industry driven by technological advances and dominated by one company with seemingly endless R&D resources, such a setback could cause irreparable damage for both Burroughs and Sperry.

We also echo the sentiments of analysts who question the merging of two of the traditional BUNCH companies. All five have been plagued by stagnant mainframe customer bases and major marketing crises for the past decade or more. The merger of one plodding, uncertain computer giant with another simply may create an even bigger plodding uncertain computer giant.

Perhaps the greatest obstacle of all to happy Burroughs-Sperry nuptials is the incompatibility of corporate cultures. It will take years before a workable merged environment evolves, and the computer industry waits for no one. If the takeover turns hostile, the cultural issues are exacerbated, and key people will certainly leave or be eased out of Sperry.

All in all, not a pretty picture. The world could certainly use at least one more effective, industrious, innovative computer company. If this is the result of the Burroughs-Sperry merger, we would happily stand corrected on the points raised above. We certainly bid them Godspeed toward this end.

News item: Six Federal Communications Commission employees swooped down onto the Comdex/Spring '86 show floor, tagging 2,500 products that failed to meet federal radio frequency emission standards.

LETTERS TO THE EDITOR

Dangers of a national data center

Your editorial, "Computers Aren't the Issue" [CW, April 14], fundamentally misstates my position on the establishment of a de facto national data center that threatens citizen privacy and personal autonomy. I also believe the editorial misreads the federal law that forms the basis for my contention. This is unfortunate since you also express welcome privacy concerns about government data collection practices that we readily endorse.

You quote me as follows: "Today, a de facto national data center is being created by this authority and modern computer technology." I obviously mean that computer technology is being used by government to implement a program to link personal record systems together and not that computers alone are posing this privacy threat. I am not a Luddite, nor am I wrong about the technical feasability of on-line access to these data bases.

I submit that it is *Computerworld* that "goes off in the wrong direction entirely" on this issue by failing to read all of the Deficit Reduction Act of 1984 (DEFRA). My concern about the creation of a national data center is not based on the section of the act that sets up a pilot program to deduct delinquent government loans from income tax refunds but on Subtitle C, which for the first time requires every state to establish a computerized State Income Eligibility Verification System.

In bureaucratic parlance, each state is now required by DEFRA to design a system to assure the "timely and efficient exchange" between federal, state and local agencies of "information" on beneficiaries or specified welfare and entitlement programs.

In effect, once a person signs up for a government welfare program, a considerable body of personal information, even confidential tax return information, may be assembled about that individual and thereafter exchanged governmentwide to detect government fraud and abuse or to keep those who do not qualify off the rolls.

Many view this de facto data center with less than alarm. They reason that if there is a privacy right of citizens to exercise some control over personal information in the possession of government and private institutions, welfare beneficiaries either waive that right, or it is outweighed by the public interest in government efficiency. We strongly disagree.

Those who are prepared to argue that poor people waive privacy rights should give pause. The middle class is about to become part of the national data center. Already the Office of Management and Budget is considering legislation to expand DEFRA data exchanges and links to Pell grants, guaranteed student loans, veterans' programs, health education assistance and other programs. New wage data sources such as government wages and benefits, railroad retirement and veterans' benefits would be added to the data base. Applicant claims would be checked against information in other benefit program files, state wage reports and Internal Revenue Service unearned income data, and the information from these programs would in turn be available for cross-checking.

Computerworld states that "the core of the issue is the question of what personal data the U.S. government is going to gather and store and who is going to have access to this data and for what purpose." We are in complete agreement.

Jerry J. Berman
Director
ACLU Project on Privacy and Technology
Washington, D.C.

Unions can protect DP professionals

Howard Karten's article, "When management calls a tune professionals won't play" [CW, April 21], on ethics and professional status was quite interesting. However, the tone of the article was far more timid and pessimistic than it need be. Most DP personnel have the same useful option available to them that their colleagues in other professional fields have adopted — unionization.

Well over 90% of all professional actors and musicians belong to unions as well as half the print journalists, three-fourths of public school teachers and about 200,000 college faculty members. The 28 unions affiliated with the AFL-CIO's Department for Professional Employees represent almost three million employees. DP professionals need to join together for mutual protection and advancement. They are eligible to do so under current laws and should move to join organizations devoted to improving their professional status. There is no need to continue to suffer in silence.

Dennis Chamot
Department for Professional Employees, AFL-CIO

VIEWPOINT

AI perspective: Japan's fifth generation to America's micros

Consider the captain of a Japanese fishing boat fishing for tuna in Ariake Bay off the southern tip of Japan. He has learned his craft from his father who learned it from his father. He knows the best time of day to sail, the type of nets to use, how deep to cast them and when to pull them in. He is an expert. But if a typhoon comes along and he is forced to fish off the coast of Hokkaido, he is in deep water, no longer an expert. He may try his old ways and hope that they work. Finding that they don't, he might experiment with different nets, ask a local captain what to do or, if Kazuhiro Fuchi has his way, consult a computerized expert system.

Such a system would contain the accumulated knowledge of thousands of fishing boat captains from all over the world along with data, heuristics (rules of thumb) and knowledge from oceanographers, meteorologists, geographers and naturalists. It would be easily accessible and readily understandable to someone with no knowledge of computers.

Fuchi, director of the Institute for New Generation Computer Technology where the fifth-generation computer project is housed, is an intense and energetic man. His knowledge of the field is awesome, and he is said to be one who, by sheer force of will, can make something out of nothing.

Fuchi admits to having had "a very skeptical opinion of artificial intelligence for a long time." To reach meaningful goals, however, Fuchi feels it is necessary to employ many different approaches and methods. For example, he asks, "Is existing computer technology enough? I don't think it is. But by making a new computer can we solve the whole problem? No, it is not that simple. We must also study thought processes and many other things."

Thus the fifth-generation project focuses on a wider range of research than do most other AI systems. The reasoning mechanism, for example, can access six different approaches (forward chaining, backward chaining, simulation and so on), and the natural language interface deals not only with meaning and semantics but also with translation between English and Japanese.

By DAVID H. AHL

Many articles mention the fifth-generation project and supercomputers in the same breath. Although some of the research is being carried out on large machines, Fuchi says, "The real impact will be on the computers that are readily available to people — personal computers — rather than mainframes or supercomputers." Fuchi thinks that widely available expert systems will have important implications for company structure and management. Such systems will permit a much more decentralized organization because appropriate knowledge will be available wherever it is needed rather than at one central point.

Until recently, AI research in the Western world was moving in a quite different direction. In 1950, John Bronowski proposed in the British scientific journal, *Nature*, that machines could be taught to play chess and that it would be possible to devise a machine that would learn, mature and even develop a style of play. Ever since then, devising chess playing programs has remained a central focus of Western AI researchers who argue, plausibly, that chess is one of the most intellectual activities of human beings and that by programming it one will learn a great deal about the way people think.

In the late '50s AI research grew even more ambitious when Allen Newell and Herbert Simon announced they were going to build a general problem solving (GPS) machine. GPS was actually less formidable than its name would imply; basically, it was a set of approaches for solving rather rigidly defined problems. GPS spawned a few descendents, but it was largely forgotten in the '60s and '70s as AI research rushed on in several other directions, most notably robotics, expert systems, pattern recognition and natural language processing.

Like those programming chess, researchers working on natural language systems tried to mimic human thought processes and, in a sense, teach the computer to understand what it was reading or hearing. Many humorous anecdotes came out of this research: the computer that translated the saying "out of sight, out of mind" to mean "blind idiot"; the difficulty computers had distinguishing between "He threw the ball" vs. "He threw the ball for charity." Although no one has yet demonstrated convincingly that a computer can understand anything in the sense that a human being can, two extremely useful principles have come out of this research: parsing (analyzing a string of words to identify the meaningful components and the relationship among them) and a recognition that natural language processing is next to impossible unless context is specified in advance.

Research projects in robotics and pattern recognition are proceeding apace, but what is most interesting today is a confluence of the other techniques — natural language processing and expert systems — along with a combination of resurrected problem solving concepts from GPS and several non-AI sources. Most of this work is taking place at the microcomputer end of the spectrum in small companies like Micro Data Base Systems, Inc., Teknowledge, Inc., Expertelligence, Human Edge Software Corp. and Neuron Data Corp. Thus, we seemed to have backed into an approach similar to that of the fifth-generation project, albeit with much less planning and on a much smaller scale.

Compare Guru from Micro Data Base Systems to Fuchi's ideal system for a fishing captain. Using Guru, you enter your own data, your own reasoning and your own heuristics. Others can also enter data and rules. When you later consult the system, the inference engine tries to determine the best approach to solving your problem — forward chaining, backward chaining or the use of "certainty factors," which are used to deal with uncertain or fuzzy situations. Guru also includes integrated standard business software.

The market for such systems so far is tiny, but it is bound to grow as new software tools are developed to combine what we know about the human mind with the power of the digital computer, tools that will work faster than any human being and think more profoundly than any computer.

Ahl founded Creative Computing Magazine *and is the author of more than 20 books on recreational, educational and professional computer applications.*

Calculating bottom-line benefits of end-user computing

My friend Jim has just taken over end-user computing at a large firm. Its senior executives want to know what they are getting from all those personal computers and from all those query and information retrieval systems. They would like to see tangible benefits from their computer investment. If they don't, Jim has a *big* problem.

Jim's employer got into end-user computing partly to quiet complaints about the MIS backlog. "If you're so smart," said MIS, "we'll give you some tools, and you can do the work yourselves." With PCs and easy-to-use packages, soon everyone was doing just that.

But the MIS backlog didn't go away. Hardware budgets soared: for the PCs, mainframe resources to support them, mainframe software where the PC wouldn't do the job and still more mainframe resources for that software. Senior management began to wonder why. Some said end-user computing can't be justified on a cost-benefits basis.

But companies can — and must — identify benefits in end-user computing: The first step is to analyze why computer investments are made.

By EFREM MALLACH

- To do more of the same. Firms need increased computing resources to cope with business growth, more product variety and increased regulation.
- To do the same things more efficiently; for example, to replace a battalion of file clerks. This and similar applications are presumably cost-justified.

Some end-user computing is in this category. Senior management may ask, "Why do we still need X managers and Y analysts with all those PCs?" They must also ask how much more complex business has become, how much faster they must react and how many managers and analysts they would need without the PCs.

- To do more effective things. This is where the remaining end-user computing comes in. Can Jim's employer respond better to environmental changes? Can it develop better new offerings? Can it price them more profitably? Can it respond to competition more quickly, with sharper focus? These are high-leverage issues. Computers are necessary for dealing with them.

End-user computing is justified by the second and third reasons. As with any justification, we come down to one question: Is the bottom line better with or without end-user computing? This depends on how it is being used and what would have been done otherwise. There are typically three possible answers to these questions:

- The job would have been done manually. There is a savings that can be documented and quantified, either in terms of reduced staff hours or improved quality of the result.
- The job would not have been done, and it should be. The benefits of doing the job can be quantified.
- The job would not have been done, and it should not be. This is not a problem with end-user computing. This is a management problem and a problem with the users' information literacy. A computer can be misused as easily as any other tool.

Such an end-user computing review will help Jim consolidate his position. It will provide management with the documentation it wants. It may suggest areas in which end-user computing is not well used and should be cut back. It will also suggest areas in which its use should be expanded. If bottom-line benefits are projected, management should go along.

At the same time, Jim will learn what types of end-user computing are beneficial. This will suggest the types of equipment to procure for its expansion. By focusing on objective characteristics, this type of analysis is relatively vendor independent.

Mallach is associate professor of computer science at the Boston College School of Management and a consultant to top managers of vendor and user organizations.

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SOFTWARE & SERVICES

Prototyping, ADS/Online join to triple productivity

AT&T Communications speeds development process

By Charles Babcock

CINCINNATI — DP managers at AT&T Communications say they have made productivity gains of three to one by using application prototyping in combination with the Cullinet Software, Inc. ADS/Online development language.

Tripling the productivity rate was the average gain for 15 communications applications developed over the last 18 months, says Richard K. Aeh, district manager for AT&T Communications' data center in Cincinnati. In some cases applications were developed twice as fast, while in other cases they were created five times as fast.

In addition to the 15 applications now in production, another 16 have been developed using both prototyping and Cullinet's development language, and while AT&T has not done a quantitative analysis of the productivity gain, Aeh thinks the three-to-one average applies to them as well.

"Prototyping really works. The feasibility study, definition and preliminary design are collapsed into a single step," Aeh says.

It is like building "a straw man," he adds. "You put a series of screens up there that helps people focus on how the application will run."

AT&T Communications set a productivity increase of 30% as the minimum needed to justify retraining and the expense of the new tools. To see if it met that criterion, Aeh's department used a procedure recommended by IBM, function point analysis, to measure its gains.

Function point analysis attempts to define standard transactions and business functions within an application and record how long it takes to program them, explains Roger A. Krantz, manager of information management at the Cincinnati center. While there is no one definition of

See PROTOTYPING page 30

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COMMUNICATIONS

WIRE TAP
Daniel Minoli

Phone changes benefit users

Several recent developments in telephone network technology should have direct and favorable impact on the data communications user. This column will discuss some of these changes, which will begin to be felt in the next two to four years.

• **Clear 64.** Various central office and carrier equipment vendors are in the process of addressing and solving the technical barriers to "clear 64."

When this limitation is solved, users will be able to access fully transparent mode 64K bit/sec. bandwidth on pulse code modulation-based transmission channels that transmit digitized voice. The existing switches now deployed at central offices were designed to treat the eighth bit of each word as a separate entity used for housekeeping (signaling) and synchronization functions.

The result has been 56K bit/sec. transmission offerings such as AT&T's Digital Dataphone Service, which cannot be easily interfaced either with 64K bit/sec. satellite channels or European clear 64K bit/sec. transmission offerings.

Another related limitation arises from the fact that existing D4 channel banks used by telephone companies cannot perform synchronization effec-

See **PHONE** page 23

Minoli is a lecturer with New York University's Information Technology Institute as well as a full-time data communications researcher and strategic planner.

Starlan earns high marks

But users must wait for AT&T's promised features

By Stanley Gibson

Starlan, the local-area network that AT&T Information Systems began shipping in volume for the first time this month, has fulfilled the vendor's promises of simplicity and ease of installation but still lacks important features, users and analysts report.

First announced more than a year ago, Starlan was designed to network AT&T's line of Microsoft Corp. MS-DOS- and Unix-based computers as well as the IBM Personal Computer family at rates of up to 1M bit/sec. over ordinary twisted-pair telephone wire. The hardware and software products that became commercially available May 1 enable users to install a basic Starlan network, in which MS-DOS-to-MS-DOS and Unix-to-Unix communications can take place.

Still missing, however, are some important networking features. Several of these features will be introduced gradually during the remainder of this year, according to AT&T.

Software enabling AT&T 3B2 computers to communicate over Starlan should be available in June. A bridge between Starlan and AT&T's Information System Network should be available in July. A program that turns an AT&T Unix PC into a server for MS-DOS systems should be coming out in September. All server programs will eventually have IBM 3270 protocol capability, AT&T says.

One of the reasons for the slow rollout of the product is that AT&T wanted to be sure the system was in fact reliable and easy to use. "You put it in, and it works," explains Matt Balkovic, AT&T director of networking laboratory computer systems, who designed Starlan.

The network gets high marks for ease of use from Mark Bierle, director of informa-

See **STARLAN** page 24

Western Union's EZ Access hooks Wang minis to Easylink

By Elisabeth Horwitt

EZ Access, a communications software package that enables Wang Laboratories, Inc.'s VS minicomputers to access Western Union Corp.'s Easylink electronic mail service, was recently introduced by Western Union.

The product is one of a series of computer connections planned by Western Union as part of its efforts to "move into the large corporations by interfacing with their systems," according to Jay Castergine, executive product manager of electronic mail services.

Through EZ Access, Wang VS users can send messages via Easylink to other Wang VS systems and Telex systems subscribing to the service. Documents cannot be revised after transmission unless loaded into a word processing document. Messages can be delivered as hard copy through Western Union's Mailgram service.

The announcement is far more important to Western Union than it is to Wang, according to Walter Ulrich, president of Walter Ulrich Consulting in Houston.

"For computer companies like Wang, the package is just another bell and whistle. But the future of electronic mail services depends on tapping customers' internal electronic mail networks. The big potential market for companies like Western Union and MCI Communications Corp.

See **WESTERN** page 23

NEW THIS WEEK

- Northern Telecom offers enhancements for its Meridian DV-1 system
- DEC introduces Vaxcluster Console System for managing Vaxcluster systems

■ For more on these and other new products, see pp. 121-154.

INSTANT ANALYSIS

"To end users, network throughput or performance degradation is less important than whether they will be able to make their favorite software package work on the network as easily as it works on a stand-alone personal computer."

— Richard Fromm, assistant treasurer, Bankers Trust Co. in New York

Fiber-optic networks expected to mushroom over next decade

Present demand low, short-haul benefits high

By Elisabeth Horwitt

While current demand for optical-fiber local-area networks remains stunted, a rapidly growing user segment will take advantage of the medium's short-haul advantages over the next decade, according to a report published this year by Newport, R.I., consulting firm Kessler Marketing Intelligence (see chart).

Sales figures for 1985 included in the report indicate that optical-fiber products are generating a very small percentage of local-area network vendors' total revenues. In 1985, Ungermann-Bass, Inc. sold only five optical-fiber networks, generating total revenue of $2.6 million, according to the Kessler Marketing Intelligence report.

Proteon, Inc. did approximately $1 million worth of fiber business in 1985, the report said. "And since most fiber-based networks are large installations, they probably sold only one or two networks," concluded Jon Zilber, Kessler Marketing's manager of market research.

Fiber network sales made up only one-seventh of Proteon's total 1985 sales, but the company expects that this year as much as 30% of its revenue will come from optical-fiber products, Zilber added. And in 1985, optical-fiber local-area network installations made up less than 1% of total network installations, according to Scott Haugdahl, senior analyst at Minneapolis-based consulting company Architecture Technology Corp. "If you take out personal computer networks, the number is close to 5%, however," he added.

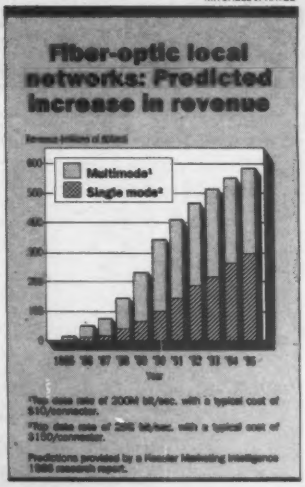
Nevertheless, support of optical fiber has been growing, Architecture Technology reports. On the vendor side, Proteon, Nestar Systems, Inc., IBM, NEC Corp. and Fujitsu America, Inc. are among the companies promoting fiber-based token-ring networks.

Artel Communications Corp. and Fibronics International, Inc. are coming out with products that provide optical-fiber connections based on a variety of network standards, including token ring, Ethernet and RS-232. And the Institute of Electrical and Electronics Engineers, Inc. 802 Committee is currently working on an optical-fiber version of the 802 local-area network standards.

IBM announced in April an Optical Fiber Repeater, priced at $6,650, that, used in conjunction with twisted-pair wiring, allows users to link multiple twisted-pair token-ring networks over distances of up to 6,600 feet. Type 5 cable, which IBM has specified for its cabling system but has not made available yet, defines two optical-fiber cables that will pro-

See **FIBER** page 24

MITCHELL J. HAYES



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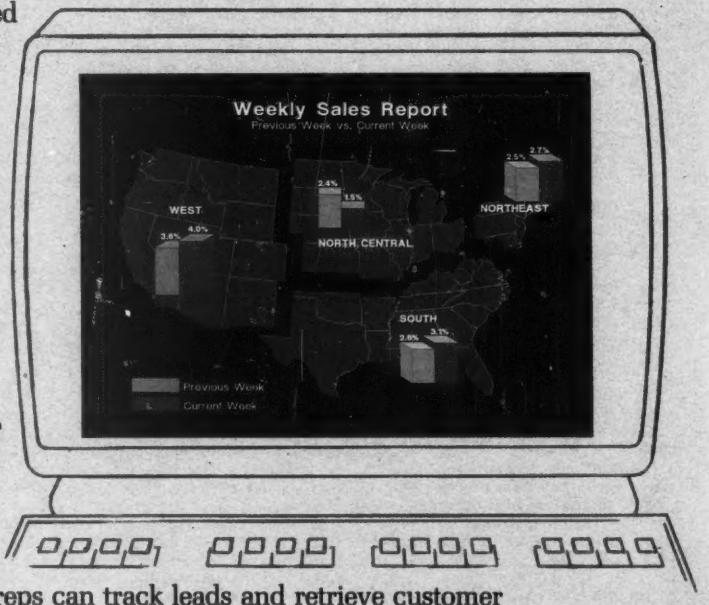

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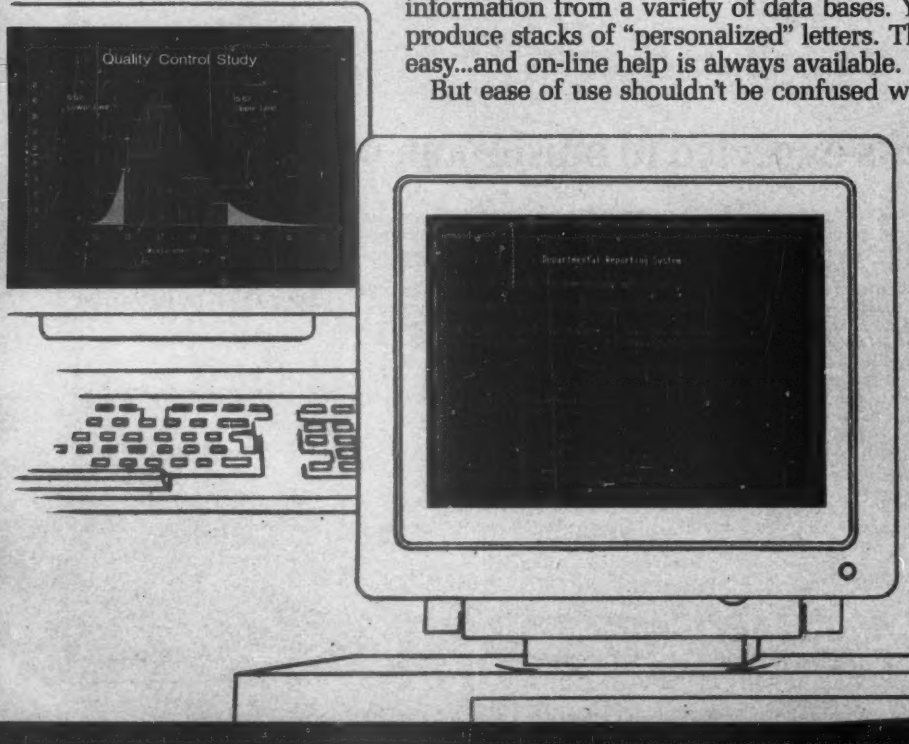

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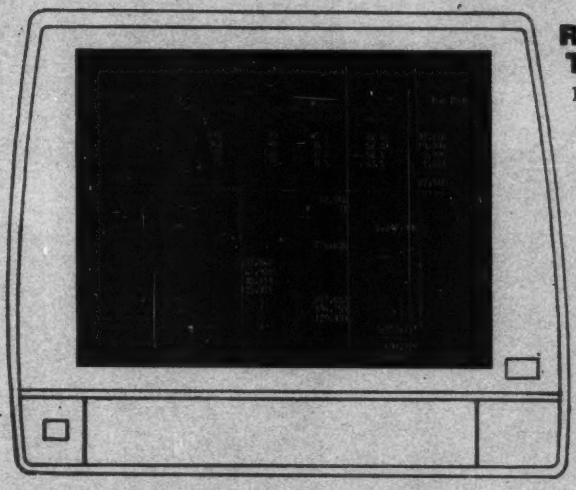

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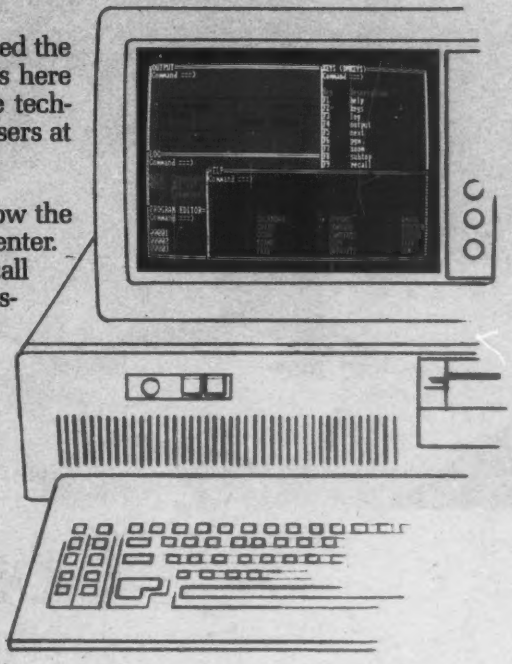

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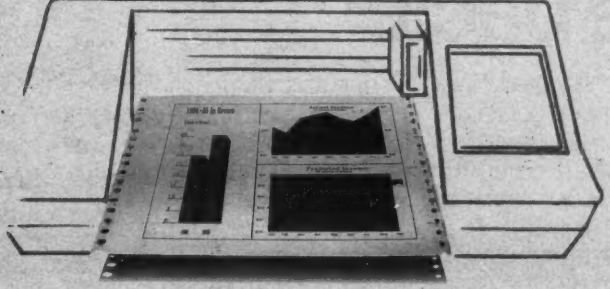

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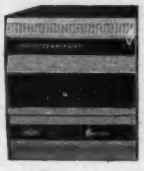

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INFOTRON SYSTEMS

Phone changes benefit users

From page 19

tively unless there is an average of at least 12% "1" bits.

As a result, link-level errors because of lost synchronization can occur during binary or graphics transmissions in which there can be a long stream of "0"s.

The ISDN architecture, which will be available soon, will provide both bandwidth and transparency.

Terminal adapter cards will ascertain that the synchronization and "1" bits are present in appropriate density. As a result, users will receive additional bandwidth and fewer link-level errors.

• **Extended superframe.** Recently introduced, T1 carrier equipment only requires 2K bit/sec. to manage a T1 line, instead of the 8K bit/sec. that was required by the older technology. This leaves 6K bit/sec. available for other service-related purposes.

The extended superframe and enhanced extended superframe soon to be implemented will allow, among other things, use of the new bandwidth for services that enable users to reconfigure their network in real-time via a data terminal.

However, first the vendors have to agree on how to allocate the extra bandwidth.

• **Network elements.** Network elements are intelligent devices that perform, among other functions, monitoring and surveillance of telephone equipment at the telephone network.

Network elements permit proactive management of the network, avoiding dependence on an outage report to spot a potential problem.

To be effective, this new breed of devices needs to transmit the collected performance data to remote computerized systems. This communication is achieved via the freed-up bits made available by the new signal formats described above, which constitute embedded operations channels.

The end user can expect better service because of the deployment of network elements by way of better bit/block error rates and channel uptime and availability.

• **DS3 service.** DS3 digital transmission facilities that can handle 45M bit/sec. data rates are starting to become available to the user. A number of divested telephone companies offer metropolitan networks tariffed at the DS3 rate.

An example of this is Illinois Bell's Novalink service. In other geographical areas, individual case basis tariffs may be available to large customers.

DS3 off-premise facilities, as opposed to in-house local-area network facilities, may be used as mainframe channel extenders that connect to remote peripherals such as disk drives, laser printers and communications processors.

It is estimated that by 1990 there will be five times as many DS3 circuit miles as there are today.

• **Syntran and add/drop multiplexers.** The current DS3 format does not provide an efficient way to extract smaller subchannels from the full 45M bit/sec. bandwidth, making it difficult for the many users who want to use the DS3 channel to support multiple sites.

A new format called Synchronous Transmission (Syntran) that is being proposed Bell Communications Research would overcome many of the problems intrinsic in the current standard and move the DS3 backbone network closer to all-digital ISDN service.

Add/drop multiplexers, which are currently under development by several switch vendors, will facilitate insertion and removal of subrate signals from a 45M bit/sec. facility without having to demultiplex and remultiplex the entire channel.

The plant enhancements described above are contributing to the gradual establishment of a true end-to-end, fully digital network, which will offer substantial benefits to the data communications user.

Western Union offers mini link

From page 19

is providing large corporations with that outside connection. If Western Union knocks on Wang customers' doors and says, 'Here is a transparent interface to our service,' they may decide to use Easylink instead of MCI Mail or Telemail," Ulrich said.

Priced at $2,500 per Wang system, EZ Access supports up to 256 terminals. Product features include billing of messages to individual clients or departments, confirmation of delivery and security functions.

"If your Wang system has an autoanswer capability, Easylink will dial it up and send mail to the appropriate mailbox automatically," Castergine said. If not, mail resides in Easylink mailboxes until the recipient accesses it.

The communications package was developed by The Information Organization Corp., an authorized Wang software developer based in San Francisco. Western Union also offers Easylink connections for Digital Equipment Corp. VAXs and IBM mainframes. Currently under development is a link to IBM's Professional Office System (Profs).

In March, MCI announced a package developed by Soft-Switch, Inc., which provides connections enabling IBM Profs users to access MCI Mail.

"Products of this type will become obsolete when the X.400 electronic mail standard allows everybody to connect with everybody," Ulrich commented.

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Starlan earns high marks

From page 19

tion processing services for the state of South Dakota's accounting department in Pierre. Bierle is in charge of a Starlan system that has been up and running for about six weeks.

Bierle says an AT&T PBX technician installed the hardware in the system on a Sunday afternoon, and a few days later, Bierle's own DP department installed the software while AT&T personnel observed.

Bierle claims that he can teach anyone to use the system in five minutes.

Bierle chose Starlan because he wanted to be able to use existing twisted-pair wire and purchase the system from a major vendor.

The current South Dakota accounting department's network of 13 AT&T Personal Computer 6300s will eventually expand to some 300 PC 6300s connected in groups of between five and 50 devices, according to Bierle.

"You really do need a dedicated file server," is Bierle's only recommendation for improving the system.

"Starlan is a very appropriate and very well-designed product for the widest variety of physical environments of any network on the market," says David Terry, president of Newport Consulting of Boston.

An entry-level Starlan consists of up to 10 PCs strung together in daisy-chain fashion over a maximum end-to-end distance of 400 feet. Larger networks of up to a theoretical maximum of 1,200 computers located over a total distance of 1,600 feet may be built in a star configuration with a hub, or Network Extension Unit, located in a wiring closet.

Although Terry says Starlan is "not priced as aggressively as it could be now," he says later versions will use the new Intel Corp. 82588 chip, which will cause dramatic price reductions. "It will be the lowest priced among the standard networks," he says.

Components available now include the following: PC 6300 Network Access Unit, priced at $595; PC Network Program, $125; Unix PC Network Access Unit, $595; Unix Network Program, $125; 3B2 Network Access Unit, $895; 3B2 Network Program, $395; and Network Extension Unit, $575. Volume discounts are available.

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IBM API (Low Level)	Yes	Yes
IBM Personal Services/PC	Yes	Yes
DOS Runs In Background	Yes	Yes
Available In PC, XT & AT	Yes	Yes
Host Printer Session	Yes	No
IRMA* Emulation	Yes	No
Available in Non-IBM PCs	Yes	No
Upgrades For Existing PCs**	Yes	No
Internal Tape Back-up Available	Yes	No
Fundamentals Training Course	Yes	No
Memory Required (4 Sessions)	120K	267K
Slots Available (3270 PC, APA)	4	2

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Fiber networks to mushroom

From page 19

vide point-to-point links between the token rings over even greater distances.

The major obstacle to widespread user acceptance, "lack of easy, cost-effective network taps," should be overcome in the next few years, Zilber said. In the meantime, vendors have circumvented the tapping problem by using optical fiber as a backbone medium that connects multiple networks based on other media.

"We're targeting intelligent buildings and campus environments," said David Monk, director of marketing at 5-year-old optical-fiber network vendor Artel. Monk cited three reasons that fiber is becoming the favored medium in these areas: distance, environment and capacity.

Optical fiber reportedly can support many hundreds of channels; an aggregate throughput of 200M bit/sec. or more, over distances of up to 40 or 50 miles without the need for a repeater, Monk said. "And it is immune to lightning and other electrical disturbances."

Ideal for campus connections

These qualities make optical fiber ideal for connecting a group of local-area networks on a campus, as a growing number of organizations are discovering. A case in point is the Harvard University Faculty of Arts and Sciences.

Last fall, the organization's technical staff decided to use optical fiber to connect 13 buildings in Cambridge, Mass., but chose not to use fiber to connect hosts and terminals within the buildings.

"We looked at several options," said technical associate Scott Bradner. "We had already installed baseband Ethernets in each building. We considered extending the baseband from building to building with repeaters, but the distances were too great. Baseband cable requires a repeater every 500 meters."

The college's second option was to use broadband coaxial cable as a backbone running between the baseband Ethernets. "But that would require installing a $4,000 modem at each node," Bradner pointed out.

The technical staff figured out that, even taking into consideration the fact that all 13 buildings were either already connected or about to be connected by broadband cable, the list price of installing an optical-fiber backbone would be only two-thirds the price of the broadband connections.

The Faculty of Arts and Sciences and Division of Applied Sciences currently use baseband Ethernets within buildings and optical fiber between buildings. The fiber connections radiate from central points to form three star configurations. The school plans to install another fiber link out to the observatory building, which currently communicates with the rest of the college over an expensive leased-line connection.

The technical staff had considered replacing the intrafacility baseband networks with optical fiber, but decided against it, "because it's much easier to install and move devices on baseband," Bradner said.

SYSTEMS & PERIPHERALS

HARD TALK
James Connolly

Why aren't users buying?

In looking at their own less-than-stimulating financial results, computer vendors have tended to pat themselves on their backs during the past year, asserting that their systems are powerful enough to satisfy users' needs and blaming that satisfaction for the lack of systems orders.

That may be true in some cases. It may be that a system delivered in late 1984 or early 1985 will keep the user happy and will keep that customer's checkbook pocketed for a year or so. But a recent survey by International Data Corp. (IDC) raises some questions about this theory.

"Existing computer capacity is adequate for near-term (1986) needs" was a statement presented in the IDC poll of 74 users and 69 vendors who were asked to say whether they agreed or disagreed with the statement. The respondents answered using a five-point scale, with the number 1 representing the strongest agreement with the statement that capacity is adequate and 5 indicating disagreement.

The average user response was 3.3, indicating moderate disagreement, while the vendors leaned toward adopting a capacity-is-adequate stance with a 2.9 average.

But IDC analyst Tom Elliott, who organized the survey, warned that while the averages indicate only a slim difference of opinion between the vendor and user groups, the groups see the capacity issue from vastly different points of view.

See **WHY** page 34

Connolly is Computerworld's *senior editor, systems & peripherals.*

Culler Scientific to offer 'personal supercomputer'

By James Connolly

SANTA BARBARA, Calif. — Having already targeted a series of minisupercomputers at the higher performance market, Culler Scientific Systems Corp. last week announced what it claims is a personal supercomputer designed to provide parallel processing on a network with workstations.

The Culler PSC, Culler's low-end system, is being offered under a joint marketing agreement between Culler and Sun Microsystems, Inc. and is designed to run on an Ethernet network in conjunction with Sun-2 and Sun-3 workstations.

Unlike Culler's other computers — the Culler 7 line of minisupercomputers that was announced in October — the PSC does not contain a kernal processor, which is the CPU that the Culler 7 line uses to execute the operating system and systems resource management.

With the PSC, those tasks are handled by the Sun workstation.

In conjunction with the PSC announcement, Culler announced 25% price cuts for the Culler 7 line of systems, which are now priced from $275,000 to $750,000.

Culler Marketing Vice-President Jeff Simon said a key feature of the Culler architecture is the integration of scalar, array and vector processing in the user processor — which is the heart of the PSC and which works in conjunction with the kernal processor in the Culler 7.

The PSC uses transistor-to-transistor logic and 128-bit words. It runs Sun software and applications, including modeling and simulation packages, produced by five third-party developers. It can support up to 16 users on a network, according to Simon.

Simon claimed that the PSC performs 18 million instructions per second (MIPS), running single-precision Whetstones and

See **CULLER'S** page 34

Hospital gets first dose of 9800

System to support medical, administration operations

By Jeffry Beeler

PHOENIX — NCR Corp.'s latest mainframe gained its first customer only a little more than a week after the machine's April 22 introduction.

In a development that coincided with the 16th annual international NCR Users Conference (Nucon), St. Louis-based Deaconess Hospital recently became the first buyer to sign a contract for the Model 9800 processor. The deal was completed in Phoenix at Nucon '86, a three-day event sponsored by the Federation of NCR User Groups.

Delivery of the 9800, which the hospital plans to use for both administrative and clinical purposes, is scheduled to take place during the fourth quarter of 1986 or the first quarter of 1987.

Deaconess has prided itself for a long time on being one of the health care industry's pacesetting users of information technology.

In 1969, the institution became one of the first U.S. hospitals to install an on-line order entry system, according to Homer Schmitz, Deaconess' senior vice-president for management resources.

Currently, the hospital serves as a beta test site for Care, an unreleased family of NCR-developed software modules that reportedly automate all phases of health care management.

The decision to order a 9800 was prompted by more than the hospital's desire to uphold its reputation as a technological trailblazer. Deaconess sees the contemplated acquisition as an opportunity to

See **HOSPITAL** page 26

INSIDE

Data Switch offers a channel connector to compete with IBM's Model 3088 unit/**26**

Cromemco announces a ruggedized supermicrocomputer/**30**

MIPS Computer Systems introduces RISC-based OEM products/**34**

NEW THIS WEEK

- National Semiconductor offers Designer Kits for 32-bit systems
- For more on this and other new products, see pp. 121-154.

INSTANT ANALYSIS

"If I were Harris, I would be working really hard to leverage what I was already doing well."

— Sandy Gant Infocorp analyst on Harris Corp.

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TOWER SYSTEMS INTERNATIONAL

Data Switch offers alternative to IBM channel connection

Price/performance advantage claimed

By James Connolly

SHELTON, Conn. — Trying to take advantage of a claimed price/performance advantage over IBM, Data Switch Corp. recently announced two products that allow channel connections among IBM and IBM-compatible mainframes.

Data Switch positioned its Model 1488 Multisystem Interconnect Unit against IBM's Model 3088 Multisystem Channel Communication Unit. Each 1488, like the 3088, is designed to interconnect up to four mainframes, but the 1488 offers more functionality for less money, according to Data Switch officials.

The second announced product is the Data Switch Model 101 Channel Link, which provides point-to-point connections between two mainframes or can be used as a backup link with a 1488.

The Model 1488, which a Data Switch spokesman claimed is the only competitor of the IBM 3088, uses Data Switch's channel-extension and matrix switching technologies to establish multiple internal data paths for connections between computers at channel speeds. That use of multiple fixed paths improves throughput by reducing the time spent on channel path selection, according to Data Switch.

The Model 1488 was designed to support 192 logical channel-to-channel adapter links connecting four processors and can be configured to provide connections with additional CPUs and Model 1488s.

Data Switch claimed that in virtually all applications the Model 1488 can replace the 3088 without impact on existing software.

The company also said the Model 1488 provides flexibility in channel address selection by allowing the systems programmer to use any number of 32 available addresses. The Model 1488 also features its own power supply and provides backup link capabilities for $10,000, and the $95,000 IBM 3088 requires a second 3088.

Data Switch said a two-CPU Model 1488 with optional backup costs $50,000, and a four-CPU version costs $90,000. The Model 101 costs $15,000.

The products are designed to operate within Data Switch's network control system, including the Model 1400 peripheral matrix switch, which incorporates switching, monitoring, testing and fiber-optic channel extension.

Today, the telecommunications industry is making advances by leaps and bounds. To help you keep up with it, there's ICA. The International Communications Association–the association of large professional telecommunications users providing comprehensive, up-to-the-minute information and education in the fields of voice, data and image communication. ICA also sponsors one of the largest telecommunications exposition in the world. It's called "Telecom." And this year it's being held in Atlanta, June 2nd thru the 5th, at the Georgia World Congress Center.

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INTERNATIONAL COMMUNICATIONS ASSOCIATION

cpw

Hospital gets dose of 9800

From page 25

improve its adaptability to rapid, unforeseen change, Schmitz said during a Nucon '86 interview.

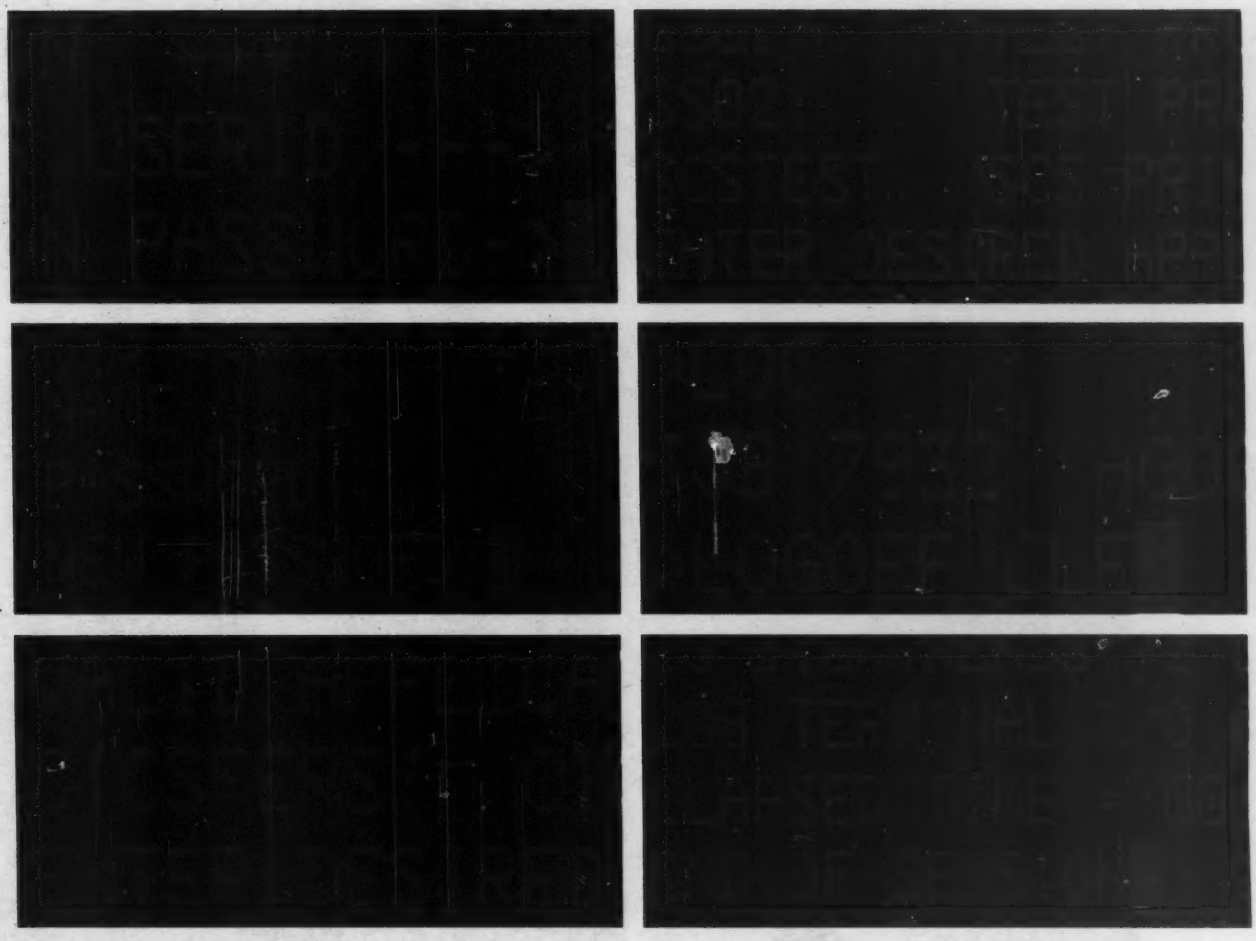
He noted that, like many other industries, the health care field is undergoing upheaval and turmoil as it enters a new era marked by greatly increased competition, alternative mechanisms for delivering treatment and new pricing strategies. The chaos comes at a time when equally profound advances are sweeping the hardware and software arena.

In the face of such overwhelming changes, Schmitz said, Deaconess was forced to ask itself a key question: What precisely will the health care system of tomorrow look like? In trying to answer the question, Schmitz and his colleagues defined two sets of future systems requirements — one for management or administrative applications and another for clinical applications.

On the management side, a prerequisite for a fourth-generation health care system is the ability to analyze patient data for price setting pur-

See HOSPITAL page 30

HOW CAN YOUR PEOPLE WORK WHEN THEY'RE ALWAYS CHANGING JOBS?



There's only one way your people can keep up with their work. Work two jobs.

Most terminals, however, require that they *change* jobs. That they logoff one job before they logon and start work on another. It's a process that's laborious, time-consuming and unproductive.

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For more information about ITT Courier's entire line of 3270 terminals, contact your nearest ITT Courier Representative. Or call the ITT Courier Sales Support Dept., toll-free at 1-800-528-1400.

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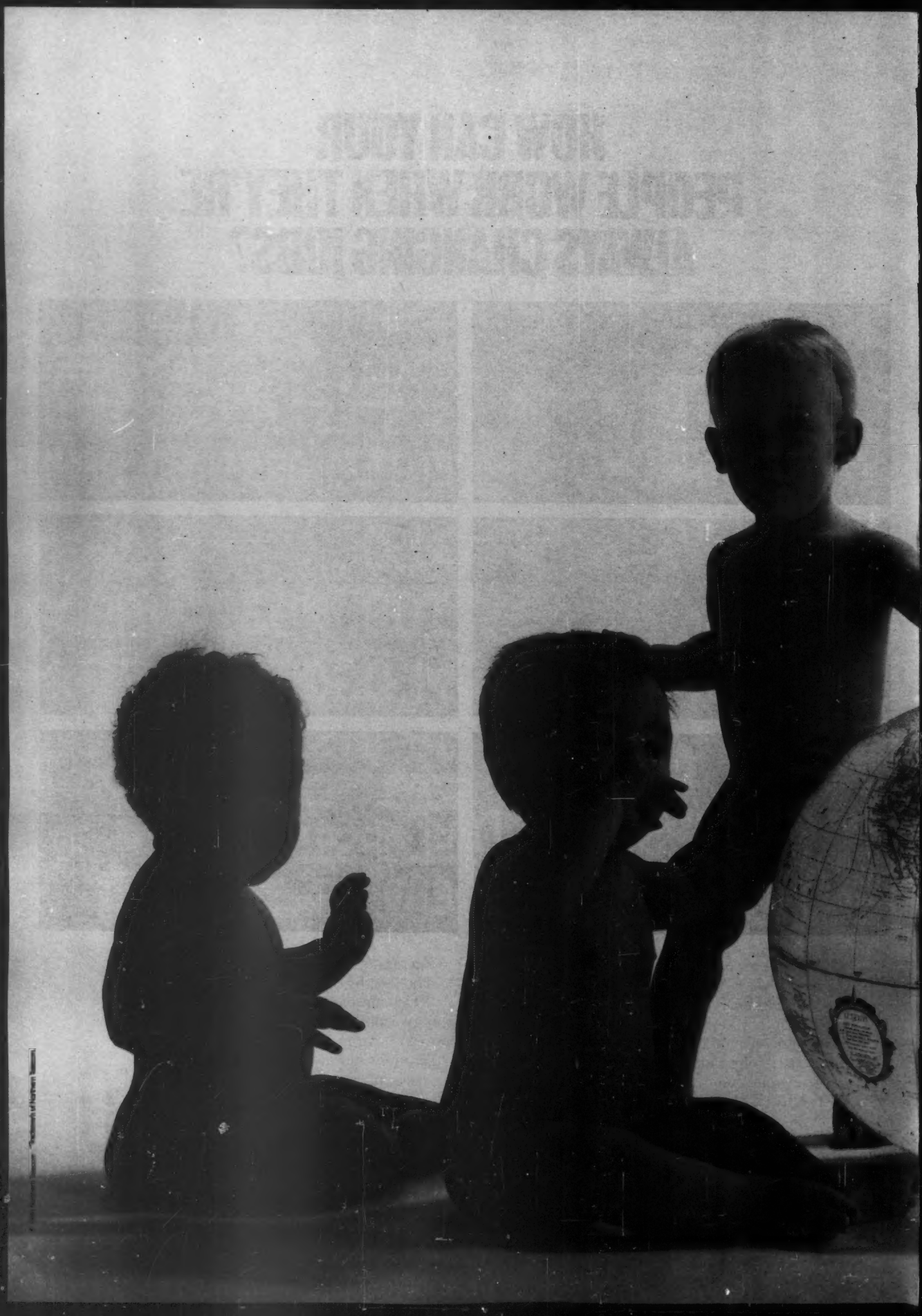

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NETWORKING

Cromemco launches ruggedized, multiuser supermicro

Made for military and industrial use

By Donna Raimondi

MOUNTAIN VIEW, Calif. — Cromemco, Inc. has announced a ruggedized multiuser supermicrocomputer designed for use in noise-sensitive, industrial and military environments.

The system, priced between $12,995 and $18,000 depending upon configuration, runs under Cromix, a proprietary AT&T Unix System V-like operating system. System V can be added for $2,000.

Cromemco is in the process of obtaining Tempest certification, according to Edward Fearon, owner of Computer Crossroads of America, Inc., a distributor and dealer of Cromemco equipment. The CS200 was designed for use in military applications, such as the Data Cartridge Tape Loader Verification system used in mission planning on fighter planes and in flight training.

"They are a very specialized company in that they concentrate on the hardware, keeping to data bases and program languages in software. Typically, a dealer for Cromemco has to write or port applications from someone else's box," Fearon said.

The rack-mountable CS200, based on Motorola, Inc.'s 68010 processor, includes a heavy-duty power supply and an all-metal chassis said to be noise-tight. Main memory comes in a 1M-byte nonerror-correcting quantity. Additions in 2M-byte error correcting increments can be expanded up to 16M bytes in a system. Internal hard disk storage is available in either 50M- or 140M-byte capacities. In systems configured with 2M bytes or more of memory, a 750K-byte random-access memory is allocated as a buffer area. The standard system is a two-user model, but support for 16 or more users can be added.

The system supports IBM 3270 bisynchronous communications, X.25 and Ethernet.

Hospital gets dose of 9800

From page 26

poses and to otherwise support the decision making process. Most existing health care systems "simply weren't put together to provide the kind of information hospitals need" to price their services competitively and to cope effectively, Schmitz said.

A health care system for the future also requires enough flexibility to respond to dramatic changes in the way hospitals operate. Such systems, Schmitz said, "have to be able to manipulate data in new ways that today can't even be imagined."

On the clinical side, meanwhile, a state-of-the-art system must guarantee uninterrupted service, which Schmitz hopes to address with the fault-tolerant features of the 9800. The hospital will keep its current NCR 8645 running the Care modules and a back-office 8595. "At the very least, a delay in obtaining the right data could diminish health care quality. In some cases, it could even be a matter of life or death," Schmitz said.

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What does NCR's 9800 add up to?

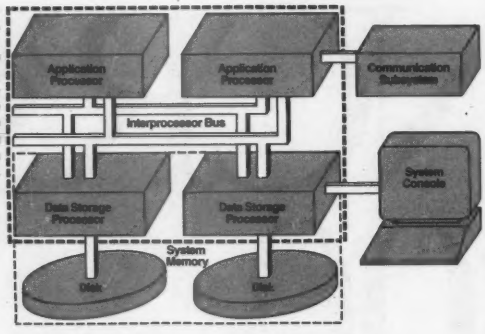
Whatever you need.

That's quite a promise for a conventional mainframe to keep.

Luckily, the new NCR 9800 is anything but a conventional mainframe.

It's an evolution.

HOW TO BUILD AN EVOLUTION.



The evolutionary architecture in a 9800. Loosely coupled processors, connected by buses, let you upgrade in smaller slices and process faster.

The secret is architecture.

Inside the 9800, we loosely couple powerful application processors (these do the work), with data storage processors (these manage the work flow).

What does this mean to you?

Say your business, like most, processes its transactions in peaks and spurts. A 9800 can handle your workload better and ensure quicker response than a conventional mainframe of comparable power.

You see, we developed a special "system memory" for your most frequently used files. And all the processors can share these files. Automatically. What's more, the processors team up—again, automatically—during these peaks, so the system has the agility to process increased workloads, whenever they occur.

Sounds simple, but conventional mainframes can't do it unless someone writes complicated application software.

With the 9800, it's part of the system.

So the computer is more efficient, more economical, and very flexible.

HOW TO GROW A MAINFRAME.

The 9800 doesn't have to be upgraded in large pieces.

It grows gradually, the way a business grows.

You start with the power you need, and then you can expand in smaller increments than is possible with conventional mainframes.

You can even add job-specific modules to handle specific functions.

IT'S MORE FAULT-TOLERANT THAN YOU ARE.

Conventional fault-tolerant systems work one of two ways: Either by doing the work twice, which is unproductive, or by using a software solution that slows processing down.

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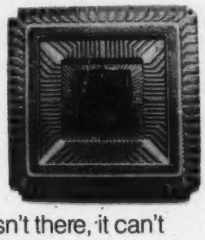
Set up a 9800 for fault-tolerance and, if a module fails, other modules take over while continuing to do their own jobs.

It'll run during a processor failure. Or a software failure.

It'll even run during routine maintenance or upgrading.



NCR's highly-reliable 32-bit VLSI processor chip.

It's built with 32-bit VLSI technology that has fewer components than conventional technology.

So, the chance of a failure inside the 9800 is very slim.

Because if something isn't there, it can't break.

THE REST.

The 9800 was built to be an excellent on-line transaction processor, as well as an excellent general purpose processor.

And it can be tailored to do both jobs more economically than conventional mainframes.

It's also an open system.

And it uses SNA and X.25 communications, so it can work together with other computers you may already own.

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And you have a choice of many ready-to-run solutions for business.

And that's everything.

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So, you only have to know two things:

It's called the NCR 9800. And our phone number is 1-800-CALL-NCR.

NCR 9800. The evolution of the mainframe.

NCR

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Culler's 'personal supercomputer'

From page 25

12 million floating-point operations per second. The PSC, which features two parallel processors, costs $98,500 and will be available on a limited basis during the summer and generally available in the fall.

Simon said that most buyers of the PSC already will have disk and tape configurations on their Sun workstations. He added that more than one PSC can sit on a network.

Analyst Jeffry Canin of Hambrecht & Quist, Inc. noted that Culler features an entry-level price lower than that of some competitors, such as Scientific Computer Systems, Inc., Alliant Computer Systems Corp. and Convex Computer Corp.

'Need fast scalar processing'

He also said, "If you look at the performance, it appears to be a pretty good balance between fast vector and fast scalar processing, and most applications, even in the scientific field, do need fast scalar processing."

Simon reported that several Culler-7 systems have been installed, but he declined to identify the user sites.

Culler President Gerald V. Butler claimed that the PSC gives users access to supercomputer-type power for less than $6,000 per MIPS. "Culler now offers processing power from the PSC to beyond the Cray Research, Inc. Cray 1-S, bracketing competing minisupercomputers and opening the market to thousands who could not consider costlier alternatives."

MIPS Computer Systems jumps into OEM mart with RISC-based products

By James Connolly

SUNNYVALE, Calif. — Acknowledging that they hope to gain from IBM's and Hewlett-Packard Co.'s endorsements of reduced-instruction set computer (RISC) technology, a 2-year-old company last week jumped into the OEM market with a set of RISC-based products.

MIPS Computer Systems, Inc. announced its R2000 product line and said its first customer is Prime Computer, Inc., which plans to use a MIPS CPU board in a workstation product.

"There is no question that IBM has done a lot for the technology with its RISC-based product, and HP underscored it," said MIPS President Vaemond H. Crane of IBM's February introduction of its RT Personal Computer and HP's announcement of its HP 3000 Series 930 and 950 RISC-based superminicomputers.

The R2000 product line is based on a custom 32-bit CMOS, said to perform up to 10 million instructions per second (MIPS).

The Unix-based boards are the R2100, R2300 and R2600 CPU boards, which are designed to perform from 3 to 5 MIPS.

The component kits are the R2065/12 and the R2065/16, which include a 12.5-MHz or 16.7-MHz CPU chip and binary code for MIPS' UMIPS operating system, utilities and C optimizing compiler.

The M/500 development system is configured around the R2300 board. A base system includes 4M bytes of memory, a 337M-byte disk drive and a 60M-byte tape drive.

Available now, the R2100 costs $3,170 in OEM quantities; the R2300 costs $4,775. The R2600 will be available during the fourth quarter and costs $6,420.

The R2065/12 component kit will be available during the third quarter for $1,750. The R2065/16 costs $2,250 and will ship in the first quarter of 1987.

The basic configuration of the M/500 development system costs $59,900 and is available now.

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A LEX COMPANY

Why aren't users buying?

From page 25

Elliott charted the responses and found that the majority of vendor responses bunched close to that 2.9 average. But the users were polarized — either heavily on the pro side or on the con side. Few users took the moderate middle road, despite the impression that the 3.3 point average gave.

Elliott's conclusion was that while individual users may not be spending as heavily as they have in the past because they are absorbing existing capacity, such is not the case for everyone.

That conclusion leads one to speculate about why people are not buying computer equipment. One oft-cited possibility is that the economy has not recovered as well as the federal government says it has. Another possibility, also frequently mentioned, is that a lot of people remain unexcited about the latest vendor offerings.

Difficult to justify a $5 million system

The reason people aren't buying is probably a little of both. If a user company is tightening its belt, it becomes more and more difficult to justify a $5 million system that provides a minimal performance gain.

The only justification for many users these days is the promise that the system can expand as their company grows, a promise that becomes meaningless if that growth does not materialize.

MICROCOMPUTERS

SMALL TALK
Eric Bender

Software hits, lower profits

Businessland, Inc. Senior Vice-President Enzo Torresi neatly summed up the computer dealer's never-ending headache: "The channel tends to stabilize at the point of minimum profitability."

At Comdex/Spring in Atlanta two weeks ago, Torresi was talking about microcomputer software pricing, although his comment covered other product categories just as well.

From a reseller's point of view, the biggest pricing problem remains software's uneasy status as a quasi-commodity offering. High-end dealers buy into expensive promotion and training efforts for a new package. Then, soon after sales start to climb, they see the software flying from the mail-order houses at bargain-basement prices.

"Success works against you in the long run," Torresi remarked. "Even the best software evolves into a commodity in about 24 months."

That may be good news, of course, to corporate buyers, who keep grinding away toward revamped purchasing agreements, as others at Comdex/Spring emphasized.

"I've got a stack of 60-page documents, written by someone in the DP department playing junior attorney," complained John Yates, an Atlanta lawyer who advises software firms. Yates, a partner at Vaughan, Roach, Davis, Birch and Murphy, added that these homegrown contracts typically end up with "a price that gives the product away."

However, the few major software

See **SOFTWARE** page 44

Bender is Computerworld's *senior editor, microcomputers.*

IBM aftermarket vendors confront tricky issues

By David Bright

Vendors of add-on products for IBM Personal Computers are not having an easy time of it. In this highly competitive business, suppliers are confronting several pressing issues: a controversy about expanded memory approaches, the determination of product focus in a rapidly changing market, distribution and pricing.

Richard Shapero, senior marketing director at AST Research, Inc., says he has been losing sleep worrying about misunderstandings caused by the expanded memory controversy. While the Lotus/Intel/Microsoft Expanded Memory Specification (EMS) is being promoted for bypassing the IBM PC's 640K-byte memory limitation, AST, Quadram Corp. and Ashton-Tate have developed another product called the Enhanced Expanded Memory Specification (Enhanced EMS).

Meanwhile, AST and Quadram have developed a bit of a rivalry concerning compatibility. "There's a lot of confusion," Shapero observes.

As a superset of EMS, Enhanced EMS is said to run software written for both. Unfortunately, says Quadram President Robert Brown, Enhanced EMS does not quite provide total compatibility.

"It's time for us to stop lobbing grenades and to be responsive to the industry's needs," he says.

Hoping to clear up the issue, Quadram last month announced the Quad EMS+ board, which Brown claims bridges the gap between the two specifications. With prices starting at $495 for a 256K-byte configuration, the board supports up to 2M bytes of addressable memory and is guaranteed to be hardware- and software-compatible with both specifications.

So far, the software development industry has shown much more interest in EMS, although Enhanced EMS is considered by many to give better support for multiple applications. For multiple-application environments, EMS supports Microsoft Corp.'s Windows package, while Enhanced EMS is tied to Quarterdeck Office Systems, Inc.'s Desqview. Software running under Windows reportedly requires more modification than that running under Desqview.

See **IBM** page 38

Zenith 'supports' 3½-in. drives

Announces graphics card, Xenix option for Z-200

By Douglas Barney

ATLANTA — At Comdex/Spring '86, Zenith Data Systems Corp. asserted that its IBM Personal Computer-compatible desktop systems are ready to accept 3½-in. disk drives. The firm also announced an enhanced graphics adapter for high-resolution graphics and text, availability of Microsoft Corp.'s Xenix System 3 for the Zenith Z-200 Advanced PC and a real-time clock.

Zenith declared support for 3½-in. micro floppy disk drives but did not offer such products. "We haven't announced actual plans for 3½-in. drive machines," said Michael Brenner, director of product planning. "What we are showing is that Zenith machines as they are going out the door today are ready for 3½-in. drives. The software is there, the disk controller is there, and all you have to do is decide you want a 3½-in. drive and bolt it in."

However, no support was announced for 3½-in. drives in the Zenith Z-171 lapsize machine. "We have no plans to change the 171 to 3½-in. drives. Such drives could probably be put inside, but we have not been experimenting with that," Brenner said.

The $499 Zenith Z-439-A Enhanced Graphics Adapter card provides 640 by 350 pixels and can present 16 colors with

See **ZENITH** page 40

INSIDE

Word Perfect software family gets shell software/**37**

Gold Hill Computers announces a runtime package for Golden Common Lisp/**37**

NEW THIS WEEK

- Kaypro upgrades its IBM-compatible micros
- Omnitel offers Omnipak multifunction card with a 1,200/300 bit/sec. modem

For more on these and other new products, see pp. 121-154.

INSTANT ANALYSIS

"Until the standard PC that IBM ships is a graphics box. IBM has absolutely no compelling reason to make a decision in the graphics arena."

— William Higgs, manager of graphics products, Digital Research Inc., on graphics-based operating environments for IBM Personal Computers

Corporate buyers find ups and downs of Asian PC clones

Imports can cost half, but there may be a catch

By Edward Warner
Computerworld News Service

FRAMINGHAM, Mass. — Highly rated by the consumer market but so far shunned by most corporate buyers, the Korean-made Leading Edge Products, Inc. Model D personal computer has established a large-user foothold at the Dennison Manufacturing Co. Based on price and IBM compatibility, the office supplies manufacturer has already taken delivery of two dozen of the machines, which are made by South Korea's Daewoo and sold by Leading Edge.

Dennison estimates that it spent less than half of what it would have cost to buy similarly equipped IBM Personal Computers. The company had already purchased 140 models of an earlier edition from the Canton, Mass., supplier.

Between 300,000 and 500,000 cheap IBM PC clones, almost all of them made in Asia, will be sold in the U.S. this year, says personal computer industry analyst Aaron Goldberg of International Data Corp. in Framingham.

While some clones will be sold by U.S. subsidiaries — Epson America, Inc., for instance, markets the Equity I — others will be resold by U.S. distributors, such as Leading Edge, or by large retail chains.

So far, the clones have gone largely to the home market, where their compatibility has been proven. Now, however, industry analysts say the Asian machines are headed for the office. The reason, says analyst Seymour Merrin of the Gartner Group, Inc. in Stamford, Conn., is that corporate PC buying is becoming as simple as buying any other commodity. Companies seek a compatible product that does the job — at the cheapest price.

When a corporate manager buys a generic IBM PC compatible, the savings can be substantial. An IBM PC with 256K bytes of memory, twin diskette drives, a Hercules graphics board and a monitor costs about $2,495. An equally configured Leading Edge Model D costs $1,495.

As with many bargains, though, sometimes there is a catch. For Dennison, the catch became apparent when the first Model Ds arrived. Under Dennison's agreement with Leading Edge, an open-ended number of Model Ds were to be supplied, each with additional memory, reports Jeff Bullock, Dennison's PC manager.

Each of the Model Ds was also supposed to have undergone a preshipment reliability test, but when the first 24 or so Model Ds arrived, Bullock realized they had neither received the extra memory nor the burn-in test. The machines, he says, "were not coming the way we required them from Leading Edge."

Leading Edge operations coordinator Buddy Carp acknowledges that his firm has had shipping problems with its Dennison order but notes

See **BUYERS** page 40

The TeleVideo 905 terminal. What a difference $10 makes.

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Word processing developers open Word Perfect Library

By Peggy Watt

ATLANTA — Developers of the popular word processing program Word Perfect have released the Word Perfect Library, a bundle of utilities that also integrates the company's several products.

Shown for the first time at Comdex/Spring '86 last month, the $129 Library features a shell that enables a user to write custom menus for data access and transfer among different applications, including Word Perfect, the spreadsheet Math Plan and the Data Path data base software.

The Orem, Utah-based software developer also announced the change of its name to Word Perfect Corp. from Satellite Software International, to identify more closely with its major product, company spokesmen said.

Windowing environment

Word Perfect Library offers a limited windowing environment, allowing the user to switch between programs with a single keystroke. It provides for keyboard macros to run under any programs, includes a calculator, appointment calendar, alarm clock, file manager, notebook and editor, and supports the Lotus/Intel/Microsoft Expanded Memory Specification to take advantage of random-access memory (RAM) beyond 640K bytes, according to Word Perfect.

"We originally developed a lot of these programs for our use in-house," said W. E. Peterson, Word Perfect executive vice-president. The calculator, for instance, includes scientific, financial, programming and statistical modes, and provides a host of display modes, including hexadecimal, binary, exponential notation and floating decimal.

"It seemed better suited to make a collection," Peterson said, so programmers added the notebook, including an address list and autodialer, other utilities and even a game.

The Library requires 384K bytes of RAM to run with the shell, Word Perfect and Math Plan, developers said. It now is available for the IBM Personal Computer Personal Computer XT, AT and compatibles. A hard disk is recommended.

The Library may also provide a boost for Word Perfect's other, lesser known products. While the data base and spreadsheet, both out for more than a year, are not as full-featured as the market leaders, they were intended to supplement Word Perfect and now can be integrated with the Library shell.

Introduced in 1982, the word processing program remains Word Perfect's primary product. The company's current focus is less on new products than on porting existing products to other systems, said Dan Lunt, vice-president of marketing.

Besides its Microsoft Corp. MS-DOS group, the company has divisions for Apple Computer, Inc.'s Apple II, Data General Corp. systems and Digital Equipment Corp.'s VAX and expects to offer Word Perfect on such Motorola, Inc. 68000-based systems as the Apple Macintosh, Lunt added.

Word Perfect already offers a corporate site licensing program that is essentially a volume purchase plan and allows updates without the return of original disks and duplication of documentation by the company, Peterson said.

Gold Hill utility product allows PCs to create runtime LISP applications

By Douglas Barney

CAMBRIDGE, Mass. — In a move aimed at allowing personal computers to deliver Common LISP applications, Gold Hill Computers, Inc. late last month announced a product that creates a runtime version of applications written with its Golden Common LISP (GCLisp) language.

The utility product, called GCLRun, allows developers to produce low-cost stand-alone applications by creating executable files from compiled GCLisp programs, the firm said. GCLRun will be available in June for $5 to $100, depending upon volume.

According to Carl Wolf, president of Gold Hill, GCLRun allows developers to distribute applications written in LISP simply and cheaply. With GCLRun, the user does not have to use a special LISP machine or load LISP onto the computer to run LISP-based applications.

"There is a pent-up demand for the ability to develop an artificial intelligence application on a reasonably priced machine," Wolf said. "You have a lot of people who bought LISP machines in 1982 and 1983, have developed applications and would like to disseminate those. You have got to deliver on a personal computer."

In addition to corporate developers, some 80 independent developers, including some of the major microcomputer software suppliers, are using Gold Hill's products, Wolf said.

Language interface

Programs written in other languages such as Microsoft Corp.'s version of C or Lattice C can be integrated with GCLRun using the product's foreign language interface. The interface allows GCLisp and C programs to access each others' data structures, providing greater efficiency and programming flexibility, the firm claimed.

In addition, GCLRun runtime output can access the Microsoft MS-DOS command line, giving developers the ability to create applications with command-line parameters.

GCLRun runs on IBM Personal Computers and compatibles with at least 256K bytes of random-access memory (RAM), but Gold Hill recommends at least 512K bytes of RAM.

IBM aftermarket confronts issues

From page 35

Overall, many vendors of add-on products seem extra cautious, watching one another closely in an attempt to figure out which products might have the best success. No longer can they afford to bring out what they think are technologically advanced products and then hope that sales take off.

Brown acknowledges Quadram's cautiousness but says his company has always been prudent. At some companies, like Quadram and Ideassociates, Inc., that conservatism translates into diversity. That way, if any one product area fizzles out overnight, the business can shift to other offerings in the company's repertoire.

At Ideassociates, what products are most in demand depends on what month it is, quips Nora Feldman Gildea, director of marketing. The company currently offers products for IBM PC-to-IBM-minicomputer communications, IBM PC-to-IBM-mainframe communications, disk storage, networking, multifunction applications and graphics.

Further strengthening the EMS camp, Ideassociates in late March introduced the 4M-byte capacity Idea Supermax/EMS card for the IBM Personal Computer AT. Prices for this card range from $595 to $2,395.

Currently, at Ideassociates as well as AST and Quadram, one hot area is IBM PC-to-System/34, 36 and 38 links. According to Shapero, AST's revenue in that area has grown from nothing to $10 million in one year. Because of this boom, all three companies plan to bring out more IBM 5251-compatible products.

The bulk of Quadram's $75 million business comes from its multifunction memory, graphics and communications products. Brown expects graphics and IBM PC-to-host communications products to see the most activity in coming months.

While diversity may have helped Ideassociates and Quadram, the concept is not working too well for Tecmar, Inc., which offers more than 70 products. Last month Tecmar laid off 70 to 80 employees from its work force of 400, according to published reports. Tecmar President Martin Alpert, however, said those figures are inflated.

The company is now reducing its number of products, Marketing Vice-President Richard Dorman notes. Tecmar's new thrust may include high-speed local-area network products, to be introduced at Comdex/Fall '86.

Comdex/Fall may also see the arrival of controller-mounted 3½-in. hard disks with capacities as high as 45M bytes. This should reflect the current demand for easily installed hard-disk storage that does not use up any desk space. Western Digital Corp., Verbatim Corp. and Mountain Computer, Inc. all report strong interest in their controller-mounted drives. And one of Ideassociates' hottest items is the 2¼-in.-high Diskit 2 dual hard disk drive that fits under the IBM PC's monitor.

Following up on the success of its 20M-byte Drivecard, Mountain has come out with a 30M-byte $1,449 version. At last month's Comdex/Spring, Western Digital introduced its 20M-byte Filecard 20, which retails for $895. "The market seems to want 20M bytes," claims Chet Brown, vice-president of Western Digital's Enhanced Peripherals Division. "It's a magic number."

> ***"No longer can vendors afford to bring out what they think are technologically advanced products and then hope that sales take off."***

However, reflecting the mood of caution, Western Digital did display a 30M-byte version as a means of gauging market demand. Brown predicts that 45M-byte Filecard-like devices should be on the market by Comdex/Fall.

Emulex Persyst, a division of Emulex Corp., is focusing on sophisticated graphics and communications boards, Vice-President Jim Orris says. An example of such a product is the DCP-88, an Intel Corp. 8088-based coprocessor card that holds up to 500K bytes of random-access memory and handles up to four IBM 3270 communications lines while the PC's processor is busy with other work.

While vendors gear up for more reseller activity, competition at the low-end retail level is pushing prices down fast. For instance, Western Digital recently dropped the price of its Filecard 10 from $1,095 to $795.

And at Comdex/Spring, AST cut the prices of several of its IBM PC family add-in boards. The changes came in response to IBM's April price cuts, according to Thomas Stickel, AST senior vice-president of sales and marketing. The suggested retail price of one of the boards — Six Pak Plus — was cut from $395 to $249. "That trend will definitely continue," AST's Shapero says.

Because many lower-end retail products are more easily copied, some companies are targeting more sophisticated, more expensive products at the value-added dealer and value-added reseller channels. Among the firms headed in that direction are Emulex Persyst, Alloy Computer Products, Inc. and Quadram.

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Buyers find ups, downs of clones

From page 35

that the Model Ds received by Dennison have run well, once configured with enough memory.

Bullock agrees but says the initial problems with the Model D have caused Dennison to take a second look at its agreement to buy from Leading Edge. That agreement, Bullock says, was only an oral one, after the Dennison legal department rejected Leading Edge's written contract.

Earlier this year, Leading Edge announced a machine clearly intended for the business market: a $2,495 personal computer with a 10M-byte hard disk drive, 1.2M-byte diskette drive and a monochrome monitor.

The company also plans to announce an agreement with RCA Corp. under which RCA will provide on-site service to Leading Edge corporate users.

Corporate users are not the only ones who have taken a liking to Asian-made IBM PC compatibles. Personal computer dealers, caught in a time of shrinking margins on the IBM PC, are finding the fat margins of the Asian compatibles — reportedly as high as 35% for the Model D — to be a blessing.

Tony Morris, president of Morris Decision Systems, Inc., a New York-based dealership that focuses on corporate sales, says, "A lot of dealers are finding they just can't get paid enough by selling IBM today. So they'll go whichever way they can to stay in business." Morris Decision Systems and MBI/Microsource, an East Coast dealer chain that targets corporate accounts, are both said to be considering taking on Asian-made compatibles.

Clancy/Paul, Inc., a five-store computer retailing chain based in Princeton, N.J., claims to be selling 400 Model Ds per month.

Balking at lesser known vendors

While ready to veer from buying IBM, some corporate buyers balk at choosing Leading Edge or other lesser known machines. Though 20% of the several thousand PCs at North American Philips Corp. in New York are non-IBM, Thomas O'Leary, director of MIS technology, points out that the machines were purchased only from AT&T and Telex Computer Products, Inc., large firms with which Philips has a long-standing business relationship.

"Leading Edge, for me, would only be as good as the retailer supplying it," he adds.

Dennison did have a business relationship with Leading Edge prior to ordering the Model D. Since the early 1980s, Dennison had manufactured diskettes for resale by Leading Edge's Elephant Memory Systems division. When Leading Edge decided to pull out of the diskette business, Dennison bought the Elephant Memory name and began marketing the diskettes itself.

During that time, Dennison also got into personal computing and bought 140 of its 200 PCs from Leading Edge. Those machines, made by Mitsubishi Electronics Corp. for resale by Leading Edge, were among the first Asian-made PC compatibles to be marketed in the U.S.

In 1985, however, Leading Edge became embroiled in a lawsuit with Mitsubishi, and problems arose with the Mitsubishi machines that Dennison was receiving, Dennison's Bullock recalls.

Leading Edge replaced the Mitsubishi PC clone with the Model D in late 1985.

Despite the earlier problems, Bullock says Dennison agreed to a quantity of them at a discount.

Dennison, which earned only $6.7 million on $661.5 million in sales in 1985, was looking to cut costs, but the company first tested the Model D and found it to be "one of the most compatible of the compatibles," he says.

Things looked rosy until the Model Ds arrived in less-than-acceptable condition. All things considered, Bullock says, "there might be a down side to dealing with [a company] other than IBM."

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Zenith 'supports' 3½-in. drives

From page 35

an enhanced color monitor. Available in June, the card takes up one expansion slot, includes a light pen interface and runs on IBM, Zenith and compatible computers.

"The Enhanced Graphics Adapter is important because it is a single board that supports both color and monochrome applications," Brenner claimed. Zenith introduced its own enhanced graphics adapter card because "our strategy has been to supply complete systems," he said.

Zenith also announced that Microsoft's Xenix System 3 is now an option on the Zenith Z-200 Advanced PC, an IBM Personal Computer AT-compatible machine.

"Zenith customers have requested that one of our offerings be a multiuser operating system of the Unix variety," Brenner said. "We are shipping System 3 now, and System 5 is announced but not delivering."

The $59 stand-alone real-time clock allows users to keep track of times and dates of directory records without inserting that information every time the system is booted. The clock runs on Zenith, IBM and compatible PCs.

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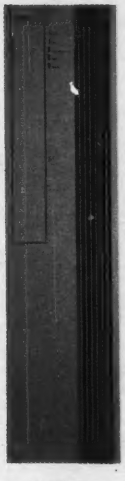

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Software hits, lower profits

From page 35

vendors that showed up at Comdex were not giving away much more than a few tip-of-the-iceberg flashes about changing customer agreements.

With all the options in distribution and support, "there's no such thing as one size fits all," said Michael Kolowich, Lotus Development Corp.'s vice-president of marketing.

User, vendor agreements

But after extensive beta testing of various arrangements, Lotus and its customers are arriving at agreements on support, connectivity, communication between vendor and user and other potential flash points. These will not emerge in one grand document carved in stone at Lotus headquarters but in a series of quiet steps.

"They're being slipstreamed in, even as we speak," Kolowich said.

As one example of initiatives, Kolowich mentioned Lotus' executive briefings for large customers. These have turned into day-long workshops at which "sales people tend to be a minority of the participants," he said. "If it's a hot-button issue, we may bring in the guys actually doing the coding and designing."

He confirmed that Lotus still intends to make a mid-year announcement on local-area network-tailored products and pricing.

Special laptop pricing

Other pricing news will be made sometime in the next month or so as Lotus ships software for IBM's PC Convertible, with some form of special pricing for those who use the laptop as a second machine.

"Users who want to run a second copy on a second machine should not have to pay full price," Kolowich said, although he did not disclose how Lotus will resolve the tangled issues involved.

As always, long-term pricing trends received much attention, with the general consensus being that productivity packages will stay about the same or drift down slightly.

Naturally, some vendors are more comfortable with that trend than others, and development costs are seen in varying ways.

Software Publishing Corp. spends 25% of its sales dollars on research and development and wants that money back and then some, commented President Fred Gibbons.

But Spencer Leyton, vice-president of sales and business development at Borland International, Inc., took another tack: "How much does it cost to put two guys in an apartment with a computer?"

> ***The few major software vendors that showed up at Comdex were not giving away much more than a few tip-of-the-iceberg flashes about changing customer agreements.***

However, vendors may spend much more than that. Leyton revealed that $8.8 million had been poured into Analytica Corp.'s Reflex data analysis package. Among that spending, $3.5 million went into advertising and related costs before the product shipped. When Borland acquired Reflex, it repositioned the software at a fraction of the original price and created a bestseller.

Both vendors and resellers expect moves toward unbundled support plans. Paperback Software International, which already charges for telephone time, "does get people who want to step through, at a dollar per minute, how to plug the machine into the wall," President Ronald Ogg remarked.

More users, however, call for help with specific applications, he said. The setup doesn't pay for itself, but it does help Paperback control support costs.

"We all talk about unbundling, but it is not at all an easy thing to do and remain profitable," Torresi noted. While IBM made that move, "it took seven years to unbundle successfully," he added.

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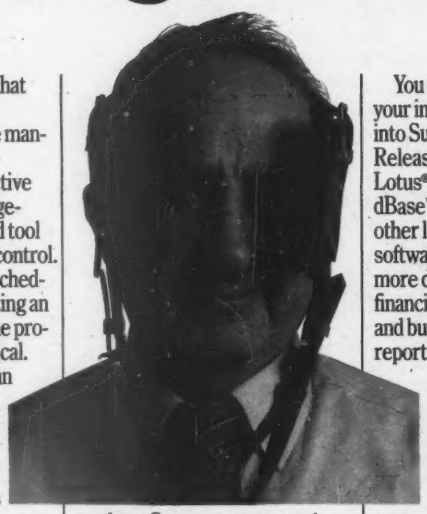

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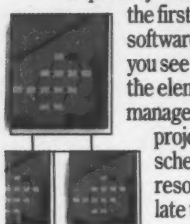

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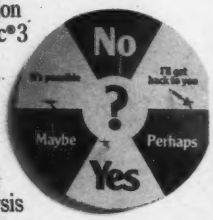

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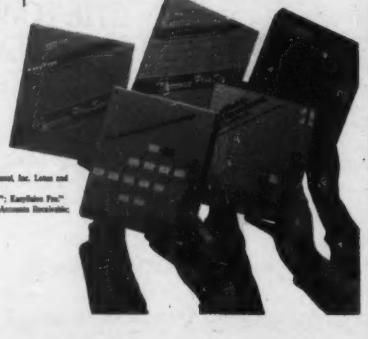

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SOFTWARE & SERVICES

SOFTLINE
Les Gilliam

DP, users must lay down arms

Reflecting back over the past 30 years in data processing, many of us have had the opportunity to witness marvelous advances in hardware and software technology. But do you know what has not changed in all that time in most companies? It is the opposing forces of users against DP.

Why must the DP organization and its users be adversaries? Why is there not a reasonable level of trust and cooperation? Why must so much energy and time be spent in quarreling about what the user wanted vs. what DP provided?

Are we not making any progress in our industry on this vital issue? I suggest a review of seven areas.

Policies. Has the management of your company determined the specific authority and responsibilities of the computer organization? Has this been communicated to all users? Are the users and DP playing by the same rules?

Lest you think this is not an important factor, just consider how many users are buying their own personal computers or other low-cost desktop units with plans to develop their own systems at a lower cost and on a more timely basis.

Will they someday want to connect their incompatible micros to the corporate network? And will management one day wonder if anyone is leading the company toward the maximum benefit

See **DP** page 48

Gilliam is an independent computer and management consultant based in Ponca City, Okla. He is a member of the Independent Computer Consultants Association and has been in data processing for 30 years.

Cincom woos DEC users

President Yablonski says 'IBM-only' no solution

By Charles Babcock

Cincom Systems, Inc. of Cincinnati is trying to regain a leadership position in the sale of data base management systems as it replaces its aging Total product with a relational data base management system, Supra. At the same time, Cincom is trying to expand its share of such application markets as accounts receivable and manufacturing software.

Yablonski

Cincom is also, surprisingly, one of the few large vendors to show significant revenue growth in sales to Digital Equipment Corp. customer sites. Cincom sales to DEC customers in 1986 are projected to reach 20% to 25% of revenue, which totaled $90 million last year. In 1985, Cincom was almost exclusively dependent on sales to IBM sites, which accounted for 95% of its revenue that year.

In a recent interview, Dennis Yablonski, president and chief executive officer of Cincom, spoke about the DEC market and general trends in the industry.

CW: I hear you are rapidly expanding your sales to DEC customers. How is that?

YABLONSKI: We have won some business where Cullinet Software, Inc., Software AG of North America, Inc. and McCormack & Dodge Corp. just couldn't compete because they came in and offered an IBM-only solution. The customer says, "That's wonderful, but what we want to do is put our master production scheduler on the IBM mainframe because it's a big application, and we want to put shop-floor control and purchasing out in the plant on a DEC."

The customer is telling them, "Your solution is to centralize everything on a big IBM mainframe with remote job entry, and that doesn't fit with what we're doing. We want to put computing and data and files out there locally. So we want DEC, and we want a compatible software strategy." We're the only major player offering that now. . . .

See **CINCOM** page 47

Speedier Ideal captures users

By Charles Babcock

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has incorporated sizable performance gains in Release 1.3 of Ideal, unveiled last week, according to early users of the fourth-generation application development system.

"We did a recompile of all our applications under 1.3. We are finding a tremendous increase in on-line response time," said Les McNelly, senior systems programmer at L. L. Bean, Inc., the Freeport, Maine, outdoor clothing supplier.

L. L. Bean used a system monitor to compare the response times of Release 1.3 and Release 1.2 and found that 1.3 aver-

See **SPEEDIER** page 46

TASC hurls Fastbol at maintenance time, automates analysis

By Eddy Goldberg

READING, Mass. — The Analytic Sciences Corp. (TASC) is today releasing Fastbol, an on-line, real-time interactive Cobol tool the company claims can halve the time needed for analysis by maintenance programmers.

Fastbol fits into any MVS/TSO or VM/CMS environment and uses standard IBM systems software. It integrates two maintenance steps: analysis and change. By working closely with IBM program editors, it allows programmers to perform both analysis and editing while remaining with-

See **TASC** page 48

INSIDE

SPSS, Inc. upgrades its SPSS-X package for DEC systems/**46**

NEW THIS WEEK

- D&B Computing Services offers DBC/1012 interface for Nomad2
- Computer Associates upgrades CA-Top Secret

For more on these and other new products, see pp. 121-154.

INSTANT ANALYSIS

"The theoretical basis on which relational systems are founded is the relational model. By contrast, the basis on which much criticism of those systems is founded might more accurately be characterized as the relational muddle."

— C. J. Date at the Interact '86 Cincom users group in Orlando, Fla.

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The second Database Derby will be held in San Francisco during the month of August, 1986. We look forward to seeing Cullinet, ADR and the rest of the database thoroughbreds in this year's run for the roses.

If you'd like to know more about the Database Derby, and how ORACLE wound up in the winner's circle, join us for a free half-day seminar at a city near you. Call 1-800-345-DBMS, or write Oracle Corporation, 20 Davis Drive, Belmont, CA 94002.

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Speedier Ideal captures users

From page 45

aged a 65% improvement over the previous version. What had been a 2.4-sec. response time dropped to 0.67 sec. in one instance and from 3.07 sec. to 0.97 sec. in another, McNelly said.

ADR claims CPU time for on-line transaction processing should decrease 35% under the new release.

"Our systems management people have noticed quite a difference in the stats coming out under CICS," said Michael C. Nekechuk, data administrator for the Canadian Broadcasting Co. in Ottawa. Nekechuk said that the statistics indicated faster CPU times but that they had not been analyzed yet for an average.

ADR has sold 715 copies of the application development system since it was first issued in September 1983. The enhancements are particularly significant in a fourth-generation language that has been sold as a heavy-duty application development system for the CICS environment rather than as an end-user tool.

Some customers, however, said ADR was only slowly improving its Ideal documentation, which was "everybody's complaint with Release 1.2," said George Halkias, data base administrator at J. T. Baker Chemical Co. in Phillipsburg, N.J.

Joseph W. Farrelly, vice-president for research and development at ADR, said most of the performance gains came as a result of "shortening the instruction path lengths to perform the same function."

Among the other gains cited by ADR were the following:

- A 30% reduction in average on-line transaction storage, achieved by trimming the number of program blocks that need to be stored per function.
- A 35% reduction in the requirement for temporary storage of I/Os between a mainframe and terminal, achieved by reducing the instruction set required.
- A 50% reduction in CPU time for batch processing Ideal applications, achieved through improved communications between Ideal and ADR's Datacom/DB data base management system. When the application indicates a sequential read of the data base is required, Datacom/DB can execute the read sequentially rather than take repeated "get record" instructions. This speeds up batch processing the most, Farrelly said.

Because of the batch processing improvement, Farrelly said Ideal can be used "for a lot larger set of programs" than it could before, including programs previously done in Cobol. He stopped short of using ADR's advertised claim that Ideal was "a functional replacement for Cobol."

"Where you are considering writing an extremely large batch program, give us a call, and we can advise you on whether Ideal is suitable for it," he said.

L. L. Bean's McNelly said his firm measured the amount of code being pulled into main memory to execute an Ideal application and found it had been reduced from 122K bytes to 74K bytes, a 39% reduction.

Halkias of J. T. Baker Chemical, another early user, said the amount of Ideal code that was "re-entrant" or shareable among multiple users had also increased.

"Before Release 1.3, a program might be 5,000 bytes of shareable code and 15,000 nonshareable. Now we notice 15,000 bytes shareable and 5,000 nonshareable," he said. The larger amount of re-entrant code reduces the amount of mainframe memory that has to be devoted to any one application, he said.

Release 1.3 is available immediately for $97,900 for OS environments and $73,200 for DOS environments.

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SPSS enhances VAX/VMS data management tool

CHICAGO — SPSS, Inc. recently announced an upgraded version of its data management and analysis software for Digital Equipment Corp. systems running under VAX/VMS.

Release 2.2 of SPSS-X, scheduled for availability in mid-June, includes several new procedures and command files that allow it to be used for system management. Release 2.1 had been geared more toward end users and data management.

The added procedures provide managers with access to such files as disk usage, accounting and the error log. These files can then be analyzed for chargeback purposes. The software provides examples of how to manage and analyze the data.

Managers can then produce such reports as "CPU by User Group by Time of Day" and "Disk I/O Operations and Queue Depth." The software has a Tables option, allowing for report generation in a table format. SPSS said the software can also be used with its SPSS Graphics package, which can produce printed reports with diagrams and charts.

Secondly, an interface to DEC's Datatrieve, a data management language used with DEC's data base management software, has been added to Release 2.2 of SPSS-X. Users can access Datatrieve data while using SPSS-X by specifying particular data bases.

Users of Release 2.1 can upgrade to SPSS-X 2.2 for free, the company said. A first-year license for new users is $6,500, with a $5,000 annual renewal fee.

— Rosemary Hamilton

SOFTWARE & SERVICES

Cincom woos DEC users

From page 45

CW: Your Mantis product is serving as an interface between the two, isn't it?
YABLONSKI: Yes. Mantis can run on either DEC or IBM hardware, and a Mantis application for one will run under the version of Mantis that serves the other.

CW: Isn't a DEC-IBM strategy particularly apropos of manufacturing?
YABLONSKI: It's especially true in manufacturing. The current wave in manufacturing automation is you can't put in a manufacturing system unless it integrates with a financial system. Purchasing has to integrate with account payables. Everything you do in order management has to tie in to accounts receivable. All that has to tie in to general ledger. So, you can't just buy a manufacturing system; you have to buy manufacturing and financial software and make sure it all fits together.

CW: What was Cincom's revenue last year?
YABLONSKI: In the low $90 millions.

CW: How much of an increase was that?
YABLONSKI: It was up about 8%. For us it was kind of shocking because we were used to 25% to 30% growth.

CW: When did you decide there was going to be a slowdown?
YABLONSKI: We recognized about 18 months ago that the market was going to level. The 30% growth that everybody was experiencing was going to be impossible for the $100 million software companies to maintain. We started to scale back our forecasts on revenue and expenses at the same time. Last year our expense growth was 5%; this year it's been about 3%.

This has been absolute culture shock for us. We've dragged people kicking and screaming through this. All of our guys are growth-oriented managers. We had to say, "Okay, you're now going to be looked at for how you spend money, and everything you do is going to be evaluated as to its return, and all those pet projects that you had going on that aren't delivering are now gone." We did it well before anyone else did and we're through it.

CW: How did you spot a slowdown that others missed?
YABLONSKI: Our forecasts were that the slowdown was coming, that it was imminent, and we did that partly intuitively but partly quantitatively. I can look at a pipeline and tell you what business will look like six months down the road.

CW: What pipeline were you looking at?
YABLONSKI: The forecasts made by our field sales representatives. You have to factor in that some sales reps give you great news. Some give you conservative news, so they can be heroes. But if you have a big enough sales organization and you factor these things in, you can get a reasonably accurate picture of how things look down the road.

CW: I still don't understand how you saw it when others, even IBM, didn't.
YABLONSKI: I think part of the reason is that we're private, and the psyche of a private company is conservative. We're not worried about pleasing a board of directors.

CW: What do you think is the appeal of your new data base management system, Supra?
YABLONSKI: One of the benefits of Supra is that you are not tied to any one physical access method. You can have one file be indexed, another file be chained, a third file be clustered, and fourth file could be randomized. There's eight or nine different choices that a Supra user has. You could have an application that is indexed because it has a lot of inquiries. Or another application is chained because it's doing a different kind of processing.

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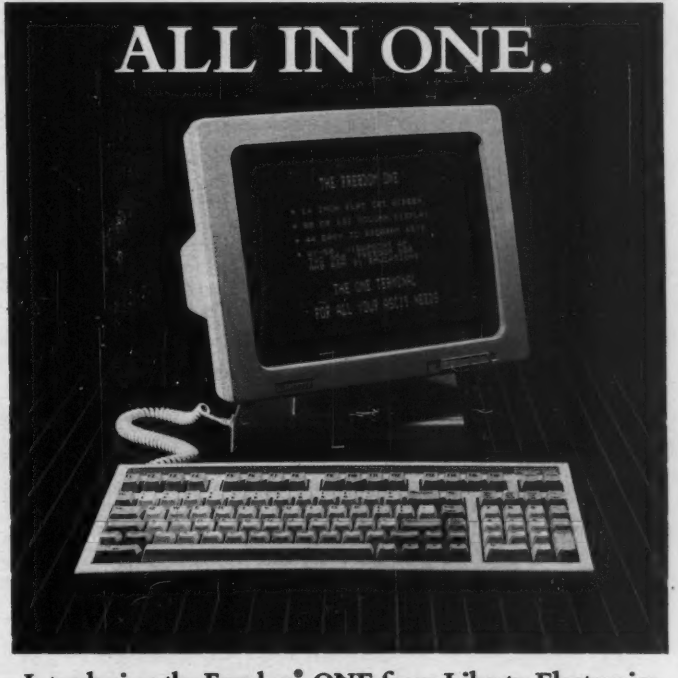

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DP, users must lay down arms

From page 45

of automation?

Or is DP still in its ivory tower, too stubborn to come down and learn the business and become familiar with the users' needs?

Methodology. Suppose a company wanted to build an office building. The firm was not sure how much money it could afford to spend on the building, but it knew it wanted the project quick and cheap. It wanted the building to meet its needs for many years, but no, the company didn't have time to do a needs-projection study.

In fact, the firm's prior experience with architects had really been a lot of trouble, with all those meetings and endless detail questions. "We've got the land. Couldn't we just hire a contractor to start, and we'll sort of tell him what we want as we go along?"

Does that sound insane? It happens every day in DP shops all around the world. When will our industry develop standard practices?

Education. How do you tell management, and specifically the users, that feasibility studies, a formal statement of needs, documented design of the system, official approval of the project, commitment of people and funds, detailed task lists and schedules are all required before a single program is written?

How do you convince them that all this preliminary architectural work will result in a system that meets their needs?

Conversely, are the DP people able to recognize when the user needs a metal building or only a mobile trailer?

Planning. A well-managed DP organization will maintain a set of long-, medium- and short-range plans. Typically, the long-range plans will cover a three- to five-year period and will be valuable in projecting space needs and equipment order lead times and contracts. The users should be asked to participate in developing the business rationale on which the plan is based.

The medium-range plan is the annual work plan developed and documented as a joint effort between each user and the DP group. This document should be viewed as a type of contract between the two parties, as to the services desired by the users, the agreement by DP to provide those services, the estimated cost of the services and the approximate schedule.

The short-range plan is a monthly document that provides a summary of what was accomplished during the prior month, revisions of the annual plan as requested by the user or required by DP and a detailed schedule of what is to be accomplished in the next month. The user will receive a copy of this report, and a meeting will be held to discuss it.

Communication. Most problems between users and DP either start or are enlarged by the lack of communication. Many people don't want to tell the user bad news. But consistent, truthful sharing of pertinent information is vital for good user relations.

Commitment. When the annual work plans, along with budgets and staff levels, are approved by management, you are making a commitment to the various users to carry out the plans as jointly prepared.

However, the user who has a reason to doubt that the DP people are doing their very best will never be fully satisfied. Commitment must be proved.

Competence. Even the best policies, methodology, education, planning and communication will not overcome a lack of competence. Be sure you have the skilled people and resources to do the job right before making the commitment.

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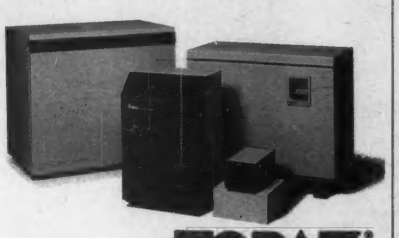

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TASC hurls its Fastbol

From page 45

in a program. Analysis is done directly from a program's source code.

Recent studies estimate that maintenance consumes from 50% to 75% of a company's programmer resources. Half of that maintenance time is spent analyzing and understanding programs, according to Barry Tudor, director of TASC's Commercial Information Systems Division. By automating the analysis phase, Fastbol allows Cobol maintenance programmers to increase their productivity, he claimed.

"Being on-line allows programmers to understand and make changes at the same time. Being in the editor allows changes to be made as you go," Tudor explained.

One beta user who reviewed the product found Fastbol's on-line interactive capability useful. "It allows you to migrate through an application quite comfortably. At a glance, you can determine what all the entity relationships are for a particular field and how one field affects all others," he said. Fastbol's cross-referencing capabilities also were very good, he added.

Fastbol features a set of five commands. The Logic Flow function helps trace the path of logic, while two others, How-Set and How-Used, show variable relationships.

The other two tools facilitate documentation. Comments provides access to existing notations left within the program, while History allows programmers to keep a log of maintenance activities for later use.

Fastbol is available for $25,000 per site, defined as three CPUs.

Product Spotlight

Edited by Barbara Wierzbicki

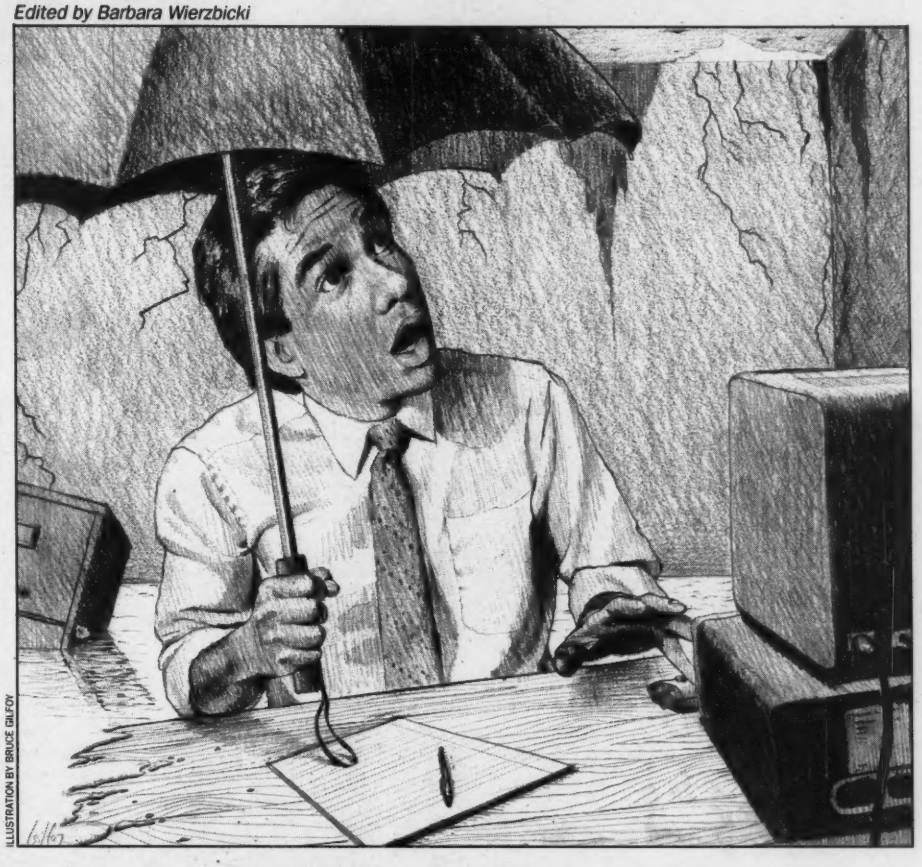

ILLUSTRATION BY BRUCE GILFOY

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Disaster recovery

Making plans that could save your company

By JOE PEDIGO

If you want to see a data processing manager shudder, assign him the task of implementing a disaster recovery plan. Devising a master schedule of procedures, inventories and personnel to prepare for the possible move to a disaster recovery site guarantees to make any manager's head spin.

And should senior management fail to endorse planning — with user participation — as a priority, attempts to provide organization and definition to planning are further complicated. Granted, many DP managers are experienced with the business functions serviced and probably can prioritize application recovery with acceptable accuracy. However, many managers do not want this responsibility, reasoning that users should have the primary say about the time frames and priority with which computer services are recovered.

Not only does the user need to identify critical applications, he must review procedures necessary to utilize the central processing function that could be relocated to an alternate site. Without user planning, the relocated central processing function may be operational but of little practical value to the actual users.

Confusion and obscure objectives will kill a disaster recovery plan before it ever leaves the drawing board. We talk about disasters in the data center, hence the need for a disaster plan. But what qualifies as a disaster? Ask 10 members of your recovery organization, and you can expect 10 different answers.

We need to define a disaster so that clear and decisive communication about the interrupting event can be conveyed throughout the company. Not only must DP be informed, the user community and senior management also need to know the specific meaning of an interruption and the predefined actions that will result. The most widely accepted definition labels a disaster as "any event that results in a decision to recover at the alternate site."

Now that a disaster has been defined, escalation plans can be established. Escalation plans are necessary because not all interrupting events are expected to qualify as a disaster. In fact, minor interruptions will be the rule, not the exception.

Typically, three escalations are adopted:

In plain English, the key is salesmanship. A manager who knows how to sell a disaster recovery plan has half the battle won at the outset.

Pedigo is vice-president of contingency planning at Total Assets Protection, Inc., a management consulting firm based in Arlington, Texas, that specializes in disaster recovery planning.

Your plan could save the company

Continued from previous page

• Minor interruptions that should negligibly affect users and computer operations.

• Intermediate interruptions that may necessitate users implementing alternate procedures until services are restored. The decision is to repair and recover at the original site.

• A major interruption that results in a decision to recover at the alternate site with full mobilization of the recovery teams.

The first escalation denotes a minor interruption.

The second and third escalations deal with a more serious interruption and the decision to go or not to go to the alternate site. This decision alone is enough to frighten even the most competent data processing manager.

Members of the executive-level management staff should also participate in deciding whether to adopt either the second or third escalation plan.

Without boundaries, the planning effort is ill defined and can easily get out of control.

To avoid this problem, the manager should develop a list of plan premises as suggested below:

• Worst-case interruption. Design the disaster recovery plan to handle a total destruction of the data center. It should also allow recovery at the worst interruption point of the daily product cycle.

• Minor interruption. The plan, although designed for the worst case, should be inherently able to support recovery for minor interruptions.

• Level of detail. The plan should provide sufficient detail to enable an experienced staff to recover computer processing. (This assumes that not all of the experienced staff will be incapacitated by the interrupting event.)

• Alternate site or sites. A worst-case interruption dictates the need to have a remote site or sites to effect recovery.

• Damage to data center only. Although user functions may be in close proximity to the data center, this plan does not assume that user functions may also be impacted by the same interrupting event. User function recovery should be addressed in separate planning efforts.

• Off-site storage. The remote, off-site storage contains the only resource with which to effect recovery.

The manager should coordinate these plan premises with the internal audit department for concurrence. Should audit concerns arise, the premises may need to be negotiated before proceeding further.

A thorough disaster recovery plan must be viewed from two perspectives. To that end, the manager should appoint both a development and implementation leader and a person who will assume ongoing maintenance duties.

The project development leader should ideally be experienced with large applications systems and a good portion of the existing applications systems, since he will work with both the user community and senior management.

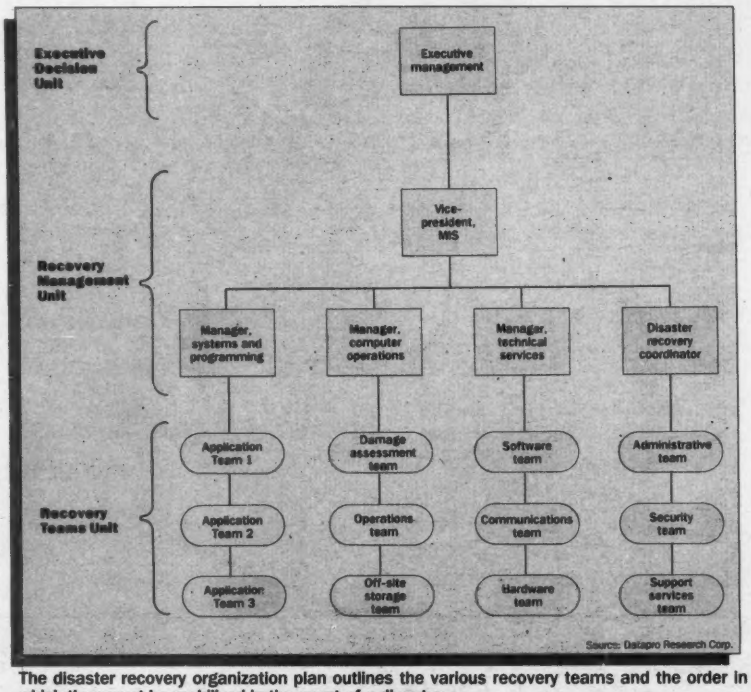
The leader must also interact with the specific skill disciplines within data processing, such as communications, operating system software, hardware, operations and applications systems, in addition to prioritizing applications systems for recovery.

To be reasonably effective, the leader should be able to devote an average of 75% of his time to the project. The maintenance person, typically a junior analyst or pro-

Continued on page 54

MITCHELL J. HAYES

DISASTER RECOVERY ORGANIZATION



The disaster recovery organization plan outlines the various recovery teams and the order in which they must be mobilized in the event of a disaster.

Holiday fire puts firm's disaster recovery plan to the test

By ALAN ALPER

It was Thanksgiving Day 1982 that Norwest Corp., a Minneapolis financial services concern, tested the full scope of its disaster recovery plan.

A fire, set in an adjacent building undergoing demolition, ravaged the firm's 17-story headquarters facility. The office building was essentially empty, and there were no injuries. And despite extensive damage to its administrative facilities, the firm, which is the holding company for Norwest Bank — an institution with some $5 billion in assets — was able to return to operation by the Tuesday of the following week.

Norwest's disaster recovery plan, completed only six months before the devastating fire, was the firm's saving grace, according to John Nugent, senior consultant with Norwest's Financial Institutions Group. At a recent seminar on disaster recovery planning sponsored by the American Management Association, Nugent said, "Without it, we would have never survived."

Although Norwest lost a number of data and word processing systems, affecting its instant cash and internal controls operations, the 3-in.-thick recovery plan document expedited its return to business. The firm survived, even though its plan "was drafted on the supposition that one or two departments were out of service, not the entire organization," Nugent reveals.

Norwest began contingency planning in the late 1960s after the formation of Norwest Information Services (NIS), a wholly owned subsidiary that handles the DP requirements of Norwest's 80 affiliated banks in a seven-state Midwest region.

Ironically, it was a 1973 fire near NIS' only data center that made disaster recovery planning a burning issue. Although the data center was untouched, the prospect of losing all of its computer data prompted NIS to establish another processing center. NIS opened its second data center in 1977, a move that not only distributed the work load but also created an alternative processing site in the event the primary center went down. In the fall of 1980, the alternative processing site was moved from its parent's headquarters to another facility, a serendipitous move considering the 1982 fire.

Unfortunately, most organizations need a near disaster to spur them into action. Many corporations have to strive hard to overcome the ingrained mentality that, "It can't happen here," Nugent says. Questions such as the cost of not operating, legal culpability and financial penalties usually provide the impetus to get upper management moving, he notes.

To that end, corporate executives must ask the hard question: What is the maximum time to belly-up if a data center goes down? "I've spoken with insurance companies who said they could operate without a data center for 30 days or longer," Nugent says. "That's hard to imagine."

In fact, a recent University of Minnesota study indicated that after a data center is down for more than four and a half days, most organizations have a hard time surviving. For financial institutions, a firm is in jeopardy of not surviving after only 38 hours, he adds.

A disaster recovery plan alone does not guarantee survival. A study conducted by Data Processing Security, Inc. states that of the companies surveyed that touted having recovery plans and that had experienced disasters, only 5% had workable plans. "That's one in 20," Nugent remarks. "That's not many."

Nugent notes that most of the plans failed because they had not been adequately updated and maintained. "Once they were completed, they were put on the bookshelf and never looked at again," he says.

Nugent concedes that it is very difficult to validate the effectiveness of a disaster recovery plan until it is put into use. The problem, he notes, is that so many firms are engaged in around-the-clock operations that there is little time to induce computer outages to test plans.

Nugent suggests that a corporation test portions of the plan to assess its overall efficacy. ■

Alper is Computerworld*'s Mid-Atlantic correspondent.*

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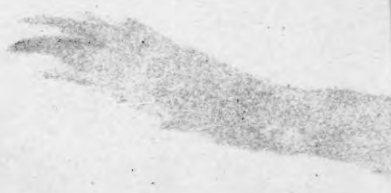

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Continued from page 50

grammer with administrative capabilities, should be assigned to work with the leader for the project duration.

The project team so far consists of 1.75 staff members. For a large, two-mainframe data center with a typical network, this team should be complemented by an additional one to two staff members in the aggregate. (The aggregate consists of staff time contributed by special shell disciplines such as communications and software.)

For the data center size mentioned above, the project generally requires an average of eight to 10 months to complete. Upon implementation of the plan, the leader hands project control over to the maintenance person, who, by this time, should be knowledgeable about the administrative requirements of the plan.

Identifying critical applications demands interaction between the project manager and the user community, because user recovery requirements will be the justification for senior management to approve the funding for a recovery strategy. The Business Impact Analysis (BIA) methodology ranks applications systems for recovery by evaluating financial losses and operational impacts should computer services be interrupted. The ranking is the net result of recovery time frames, adjusting for dependent applications. The recovery time frame represents the critical time line from the point of the interruption up to the point an application system must have been updated to current status.

Establishing recovery time frames hinges on the ability of the project team interviewers to guide users effectively to conclusions on the longest possible time they can be without computer services. Typically, this time frame is that point beyond which financial losses and operational impacts become unacceptable to the company as a whole, as well as to individual user departments.

While conducting the BIA, the manager needs to be sensitive to the costs involved in maintaining a backup plan. He must understand one of the basic trends in planning: the shorter the time frame specified to recover the most critical application, the higher the cost to maintain a plan. Conversely, the longer the recovery time frame, the lower the cost. While this trend is not an absolute, it has proven to be a reliable guideline. Therefore, the BIA interviewers should seek the longest possible recovery time from each user knowing that maintenance costs can probably be reduced. One way to achieve longer recovery time frames is to explore alternate user procedures. Data processors are often surprised that manual procedures for many critical applications, such as payroll, can still be employed, although some are good for only short time frames.

Obtaining approval from both the user and senior management of the priority ranking of applications systems for recovery and their accompanying critical time lines represents the milestone for identifying critical applications. To prepare for approval, the manager should have the results reduced to graphics or summary form with adequate detail backup.

The graphics can include a chart listing applications systems by recovery priority with critical time lines shown on a per-day scale. Other charts can summarize the financial loss and operational impacts by application system as concluded by the user. These final documents will be the base planning criteria for the next phase of disaster recovery planning.

Developing a recovery strategy may commence once users and senior management approve the priority list for recovery with critical time lines. Most of the work effort at this stage is performed by data processing, whose primary objective is to develop a recovery strategy that best meets the needs of the organization.

A recovery strategy is simply the process of selecting the most practical and cost-effective alternate site to go to in the event that the original center experiences a major interruption. Basically, the selection criteria for choosing an alternate site consists of the following:

- The earliest time computer processing must commence at the alternate site to meet critical time lines.
- The minimum configuration(s) required to process critical applications.
- The minimum communications requirements to satisfy critical applications processing.

The project team begins shaping a recovery strategy by developing applications recovery scripts, typically free-form narrative statements that summarize the essential information needed to recover applications systems. These scripts, used by applications systems personnel during recovery to design a reconstruct and update plan, help restore production files to current status within specified time lines using only backup stored off-site.

The applications recovery scripts should specify the saving of input documents by the user or data entry in anticipation of a major interruption, the saving of input after the interruption and the method and time frame required to reconstruct and update files. Although these scripts identify which production files are to be backed up and with what frequency, I strongly recommend conducting a verification. Actual testing generally produces 30% to 40% additional files that demand inclusion in the backup rotation.

As part of the ongoing contingen-

cy program, the systems analysts need to reconcile any rotation schedules with computer operations. The analysts should verify that all backup files produced are accurate and can be used for recovery purposes. Applications recovery scripts should become part of the disaster recovery plan and should always reflect the actual backup rotation scheme.

Hardware, software and applications specialists should be involved in developing the time frames for operations recovery. The hardware and operating system planners must determine the minimum computer configuration that can be utilized for recovery, as well as reasonable compatibility of software. Some plans today specify configurations at least equal to or greater than the existing equipment because of data base architecture or because of projected overload activity during the reconstruct and update processes. Planning may also

- specify what configuration is needed during the initial stages of recovery and what equipment upgrade is needed for subsequent recovery stages.

> ***Data processors are often surprised that manual procedures for many critical applications, such as payroll, can still be employed, although some are good for only short time frames.***

Using the results of the applications recovery scripts and other data, the planners develop base recovery time frames. Base recovery consists of loading operating system and subsystems onto an alternate computer, loading communications software systems and checking backup circuits and loading the latest versions of backup production files onto the alternate computer and verifying the accuracy of files.

The team usually calculates the time frames required for the base recovery events based on the existing computer system to develop a standard. Variations on the standard can be calculated based on minimum equipment requirements and on other configurations that may exist in an alternate site.

The third specific time frame involved in resumption of computer processing at an alternate site concerns operations recovery. Operations recovery consists of a reconstruction of production files from the latest off-site versions up to the point of the interruption and an update of production files from the point of interruption through the current day of business activity.

Obviously, base recovery and operations recovery time frames are subsets of the critical time line. Considering the highest priority application(s), the required base and recovery time frames must be satisfied to meet the critical time line for the higher priority application(s). Reconciling these time frames also provides the planners with the earliest time that base recovery must commence at the alternate site.

At this point, the project team can list the criteria for selecting the alternate site. The list should contain the following parameters:

- The time frame from the interruption point to the point that recovery processing must commence.
- The minimum computer configuration required to process critical applications.
- The minimum communications devices and backup circuits required for critical applications.
- The minimum space requirements for essential staff members.
- The minimum support utilities required for the minimum computer configuration as well as for any planned upgrades in subsequent stages.

With these criteria, the project team can poll alternatives available from the various commercial backup centers (see story page 56) and can select two or three options to present to the senior

Continued on page 60

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Contingency options abound with off-site backup facilities

By MARY AINSWORTH

"No!" responded a contingency planning manager for a major corporation when asked if the company would build its own disaster recovery site. "Not only is it expensive," he continued, "but someone would decide to use the facility before a disaster, and soon it would be an *additional* instead of a *backup* facility. After looking at all the alternatives, we contracted with a hot-site vendor."

What options exist if your company decides it also wants to look outside for a disaster recovery location?

Choices vary depending on your specific needs — options include a reciprocal agreement to use another company's computer facilities, a cold site, a hot site or mobile hot and cold sites. Since each disaster recovery option has its own advantages and disadvantages, managers should select the option best suited for their specific company's operations.

A reciprocal agreement, made between your company and another, allows each to back up the other in the event of an emergency. Although a cost-effective alternative, the reciprocal agreement offers no guarantee that the other company will not be facing an emergency that it considers as critical as yours when disaster arises. Needless to say, the company with the working computer facility will probably consider its job of higher priority than yours. However, some companies find this the only alternative if they have computer systems from vendors that are not in the mainstream of the market.

A cold site (or shell site) provides companies with an emergency facility ready to house a computer system in the event of a disaster. It is built with adequate air-conditioning and raised flooring, both necessary to support computer systems. However, successful recovery operations hinge on your having well-made plans to move in the necessary computer system and supplies to the cold site in a timely fashion. Simulated tests of this recovery aspect should be conducted to ensure that all will function properly if a real disaster strikes. Plans should also be made for the needs of the DP people staffing the site such as desks, telephones, running water and rest rooms. Vendors are available that offer subscriber services to their cold-site facilities.

A hot site provides both the site and the needed backup computer system — generally available for use within 24 hours after notification. However, hot sites are the most expensive alternative because not only the site but a fully configured computer system are included. Vendors are available that offer subscriber services to hot-site facilities.

A mobile hot or cold site, beyond providing backup similar to standard hot or cold facilities, offers the flexibility to move the site to a location your company specifies. This is an emerging market with only a few vendors, such as Provident Recovery Systems of Cary, N.C.

Since the standard hot site is the most expensive option, a list of criteria for its selection follows:

- Type of host computers supported. The hot site must provide the same computers (or CPU-compatible systems) that are installed at your

Ainsworth is senior associate editor for "Datapro Reports on Information Security," published by Datapro Research Corp. of Delran, N.J.

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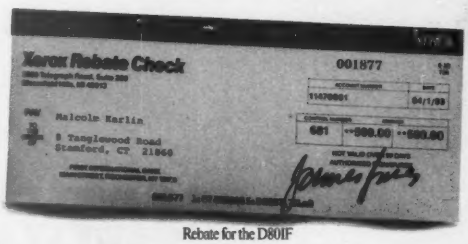

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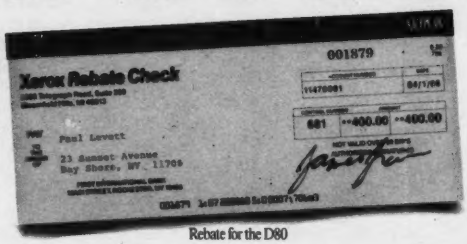

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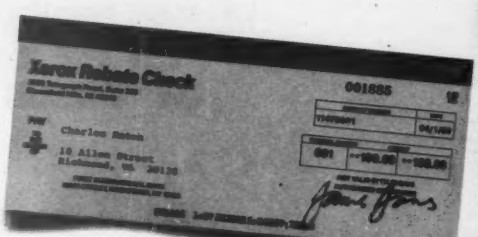

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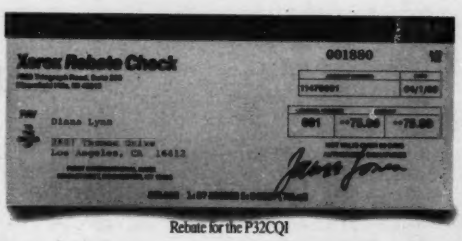

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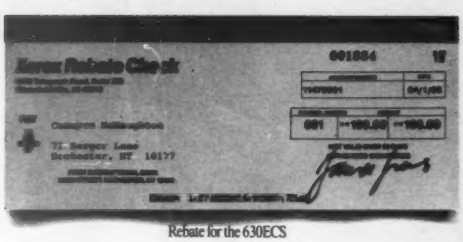

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main data center.

• Location of the hot site. Many believe that a hot site should not be located in the exact geographic area of the main computer center it will replace, because if a natural disaster such as an earthquake or a flood should occur, both sites could be damaged. However, location at too great a distance from the main facility means that the staff would have to be transported to and housed at the remote site. Disaster plans should then cover personnel costs for transportation, lodging and food. (Even if these expenses are acceptable, many employees will not leave their families in the event of a disaster.) The location of a vendor's backup site is another consideration. If you were unable to use your primary contracted hot site, what alternative location would be available?

• Number of communications lines. If your company's recovery operations depend on receiving data from remote sites, check to see what communications lines are available at the hot site. If additional lines are needed, plan to install them as soon as the site is selected.

> ***Prioritize the jobs that your company has to run in the event of an emergency. Only critical high-priority jobs should be scheduled for the hot site.***

• Amount of test time. Test time at the hot site will allow you to ensure the effectiveness of your recovery plans. Costs for testing should be detailed in the contract; some vendors require that subscribers test their procedures as part of the contract.

• Current and maximum number of subscribers. This number reflects other companies that also contract to use a site's backup facilities. Some vendors limit the number of subscribers. It is not only important to know how many others are subscribers, you should also learn what procedures exist if more than one subscriber needs to use the site at the same time.

• Site security. Whether a hot site provides a 24-hour on-site security staff is an important consideration for some subscribers. Sites may also have physical security installed, such as closed-circuit TV and/or card access systems.

• Data storage. Some sites have storage capacity sufficient to house subscribers' magnetic tapes, microfiche and documentation. Extra charges may be made for this service.

• Plan storage. Most vendors allow subscribers to store their disaster recovery plans at the hot-site location.

• Technical support. Systems programmers and other technical personnel are available at some hot sites to help subscribers implement their backup procedures.

• Monetary considerations and terms. These factors are critical to your decision and include subscription rates, initiation fee, per diem/usage charge and length of contract. The subscription rate is generally a monthly charge paid by a subscriber to the service. The initiation fee (also known as the declaration fee) is the amount charged to the subscriber at the time of request (notification) to use the emergency services. The per diem/usage charge is the cost per day for actual emergency use of the site and may include the initiation fee. The length of the contract describes the amount of time that the subscription will be in effect.

Not only should you consider these criteria in determining which vendor best meets your hot-site needs, you should also prioritize the jobs that your company has to run in the event of an emergency. Only critical high-priority jobs should be scheduled for the hot site, and only the configuration needed to run these jobs should be contracted for with the vendor. ■

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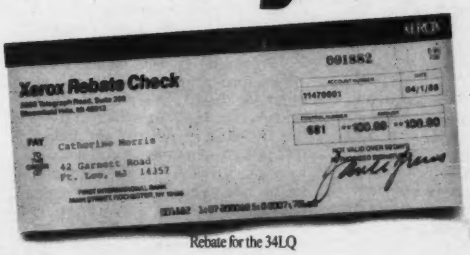
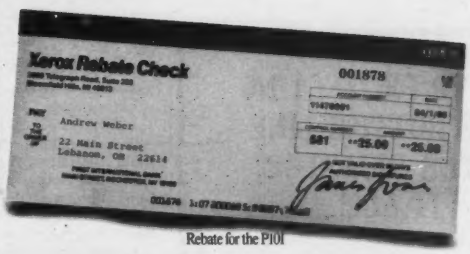
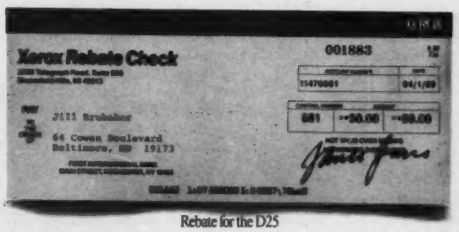


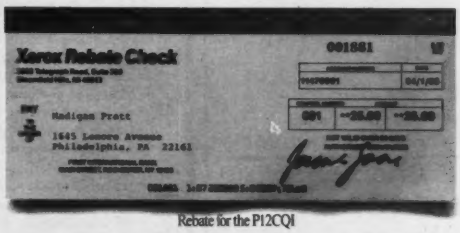
Rebate for the 34LQ



Rebate for the P10I



Rebate for the D25



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635 34LQ

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Interview

Preparing for catastrophe: 'You can't dodge the bullet'

Not protecting the reams of information kept on magnetic tapes and disks from natural or human-related disasters places corporations in a precarious state. Security industry research shows that most companies could not survive more than one week without their computer systems. Yet 25% of the Fortune 1,000 companies have not implemented disaster recovery plans and 25% to 50% of the remainder have inadequate plans in place. Raymond Hipp, president of Comdisco Disaster Recovery Services, Inc., spoke with Computerworld *Associate Editor Barbara Wierzbicki about disaster recovery planning and implementation.*

What is the biggest barrier to DP acceptance of a recovery plan?

The problem with disaster recovery is that it's not something anybody wants to do. The only time you're going to use a disaster recovery plan or get your return on that investment is if some catastrophic event or serious contingency outage takes place. It's something that gets tremendously in the way of the day-to-day production and development environment that most DP executives were hired to manage. It has a rather poor perception on the part of senior management and data processing management as something that you put off until the very end — until the auditor or the outside regulatory body comes back again or until the board of directors brings enough focus to the question of "What if?" and the risks are acutely defined. Once that takes place, you can't dodge the bullet any longer.

ILLUSTRATION BY BRUCE GILFOY

Comdisco's Raymond Hipp

> ***On a minimum of two times per year, organizations should assemble the team, bring it into the recovery center and exercise the plan.***

What, then, is the argument that a DP or MIS director should make to top-level management to justify spending on disaster recovery?

The argument today is not voiced as it was four or five years ago. Back then, most of the pressure came from the bottom up; that is, data processing management had already focused its attentions and was trying to make senior management aware of the need for disaster recovery planning. Today the argument seems to be coming from both parties. There's an awareness and a willingness to deal with the problem as there never has been before, but the project has to be appropriately defined, staffed and equipped in order to get the proper job done.

Have federal laws prompted businesses to implement contingency plans?

Well, I think that was probably the main reason a couple of years ago, particularly in the regulated industries like banking, insurance and public utilities. But most of that business has already come forward and has done something about the problem. I don't think it's the government per se or even outside auditors as much as it used to be. It's more a matter of pragmatism. And that is an understanding and an awareness of the catastrophic events that the loss of the DP utility would bring to a corporation. If you put a pencil to that, in most corporations, that's a big number.

How often should a disaster recovery plan be tested full scale?

On a minimum of two times per year, organizations should assemble the contingency team, bring it into the recovery center and exercise the plan. You do that for two or three or four tests. After that you do a pull-the-plug test, where — with no one knowing other than senior management — you walk into the data center one morning and say, "You are no longer in business; you have just had a contigency." That's when you're going to find out how prepared you are.

Can you describe how disaster recovery services are priced by taking a typical large company's annual expenditures and breaking them down by service levels?

One percent of the data processing budget is a good barometer to use as a planning tool to discern the total annual cost for disaster recovery. That includes the contingency planning, the permanent staff, the travel required to perform testing at the recovery center, the subscription to hot-site recovery services, the whole ball of wax. When I first heard this several years ago, I thought it was too simple to throw a number out like that, but frankly that's about as good a number as I've been able to come up with.

What options are available for smaller companies that can't afford hot or cold sites?

One advantage that minicomputers and microcomputers have from a processor and peripherals standpoint is that they don't require as much of the environmentally conditioned facilities as do the larger systems. In other words, they don't require water chilling or motor generators, they require less air-conditioning and so on. They have much smaller networks, so it is easier to restore those organizations on a real-time basis. The first thing that smaller shops have certainly got to be doing is focusing on having their data backed up and off-site.

How effective are alternatives such as warm backup and mutual aid agreements?

In my mind, there is no benefit to the reciprocal agreement of mutual aid. I don't really see that conversation taking place very often in the U.S., because if you ever put that into practice, in essence you would have two disasters rather than one. It's not just the auditors that see through that — anybody with a nickel's worth of experience understands that problem. . . . The mutual aid reciprocal agreement is definitely on its last legs. The warm site, that is, a cold site with communications capabilities, has some application for the minis and micros. As long as you've got the communications network — and if you don't have a lot of special devices on your mini — you could probably get that environment back up in a week or so.

When should a company build its own disaster recovery center?

That's strictly economics. There are a number of large companies that have built their own redundant backup centers nationwide but here's what happens: First, it is virtually impossible to protect that environment from development work. Any time you leave spare capacity in an organization, somebody's going to figure out a way to get at it. When you eventually run out of production capabilities, the backup center turns into a total production environment — and you've lost it. Then you've got to go build another backup center and then another.

The second thing that happens is when a company starts examining the ongoing costs of keeping that capability in sync with all of its own growth plans, the cost gets totally out of line as compared to subscribing to a service. ■

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Continued from page 55

management staff.

Be advised: Top-level management's main concern with the bottom line will require providing hard figures on the costs involved in maintaining each of the proposed alternatives. These costs are ongoing and are to be viewed as a special type of insurance premium that provides protection against potential losses and impacts identified in the BIA.

It is at this point that the manager can expect to be challenged about the probability of an interruption. Therefore, the project team must be prepared to provide statistics on probabilities of fire, flood, storms and other disasters.

Logistical analysis to recover the data center represents the next phase of disaster recovery planning. Once senior management approves an alternate site, it is time to address the logistics of making the alternative work.

The first course of action is to design the disaster recovery organization (DRO), a predefined synchronized set of recovery actions to be executed in the event of a disaster. Surprisingly, recovery actions can be extensive but at the same time quite logical. The ideal DRO reflects the organizational structure of the data processing department. The diagram on page 50 depicts a typical DRO that may be developed for an organization. A summary of the recovery teams' functions is as follows:

Damage assessment team assesses the damage to the data center and estimates the mean time to repair or replace and resume operations. The team should present findings to the DRO manager within four to five hours of the interruption.

Security team establishes and enforces security at the damaged facility in accordance with predefined procedures and any special instructions conveyed by management.

Off-site storage team establishes control of and organizes the off-site storage facility.

Administrative team establishes the command post for the DRO and provides administrative and clerical support to the DRO and recovery teams, including extraordinary expenses and personnel and family administration.

Software team installs and examines operating system software, subsystems and production files on the backup computer system to assist in the reconstruct and update process.

Communications team switches data and voice communications facilities from the original site to the alternate, installs communications software modules and assists in examining circuits and devices.

Application team analyzes and determines the start point from which reconstruct and update processing must commence. This team takes the lead in the design and publication of the reconstruct and update plan and coordinates all production file update activity.

Hardware team acquires and installs any equipment designated for emergency order or relocation in the alternate site.

Operations team establishes operational facilities at the alternate site that will include accessories, scratch tapes, forms, stock paper and shift schedules. This team performs the reconstruct and update processes at the alternate site.

Support services team secures housing and office space for personnel and provides logistical support, including transportation of material, supplies, equipment and personnel.

In a worst-case interruption, items at the original center are not usable for recovery. Therefore, items stored off-site must be sufficient in number to bring recovery of DP services to an acceptable level. In addition to identifying the many different items that will be required, the manager must ensure that they are maintained in current and complete form. I suggest assigning maintenance responsibility to the appropriate team and monitoring the program with periodic audits.

Last, management should support contingency procedures in order to have a viable ongoing plan. Without management support, the plan will be outdated and unusable within a year. Why spend money to develop a plan if there is no intent to update it?

Once the project team has outlined the logistical plans to effect recovery, they, together with the recovery teams, should conduct a structural walk-through with management for concurrence and approval.

Documenting the plan can then occur. You may develop your own plan or select one of several formal plan formats available in the marketplace today. Whichever option is exercised, the manager's overriding concern must be the ongoing maintenance of the plan and the possibility that the plan may actually be used. Simplicity of content and good organization should be its objectives.

A sample plan outline that can be used as a model for any organization is summarized below.

- Introduction: Includes objectives, scope, authorization and the premises upon which the plan has been developed.
- Recovery time frames: Includes documentation and charts depicting base recovery and operations recovery time frames and critical time lines, as well as indicating time-related events necessary to achieve recovery processing at the alternate site.
- Recovery strategy: Includes a complete overview of the entire plan to reflect all the synchronized actions and events that must take place to effect recovery. Also addresses command posts, extraordinary ex-

Chances are you don't currently audit your operating system—even though it's ultimately in control of information used to manage your organization. And for good reason.

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For more information, contact Shawn McLaren today, at 1333 Lawrence Expressway, Santa Clara, CA 95051-3595; (415) 941-4558; Telex 357437.

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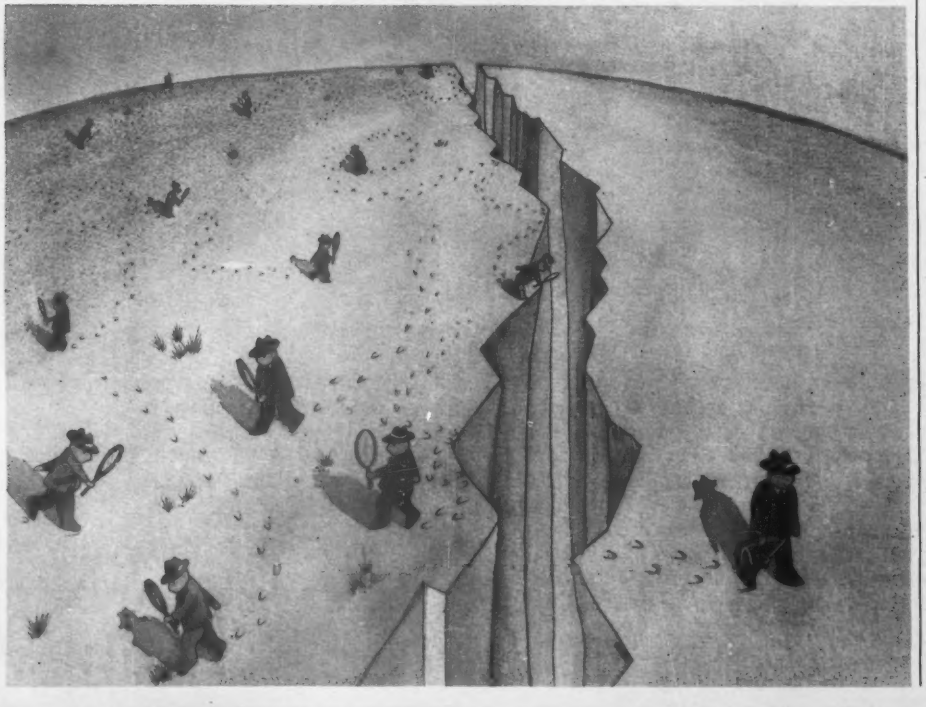

pense, insurance claims, personnel administration and so on.

• Qualifying a disaster: Includes an explanation of escalation plans, the decision processes in selecting an escalation plan and formulating a plan announcement.

• Applications systems subplan: Includes the plans for recovering applications systems (contains the applications recovery scripts) and maintenance responsibilities.

• Hardware/software subplan: Includes the plans for recovering the hardware and operating system software elements of the data center and specifies maintenance responsibility of respective off-site items.

• Communications subplan: Includes the plans for recovering the communications element of data center services and specifies maintenance responsibilities.

• Workstation subplan: Includes the plans for recovering data entry and other key workstations in operations and specifies maintenance responsibilities.

• Off-site inventory subplan: Includes the plans and procedures for cycling and storage of items off-site and actions during recovery mode.

• Disaster recovery plans: Includes a definition of the organization, objectives and actions and responsibilities of management and recovery teams.

• Emergency notification plan: Includes a plan to notify the disaster recovery organization and other key offices and the sequence of notification.

• Plan administration: Includes ongoing procedures to maintain the plan as well as to schedule and conduct tests of the plan.

Before a formal plan is adopted, obtain concurrence from the key members of the disaster recovery organization to ensure that it is logistically sound and complete with necessary actions. Comments or suggested changes are reviewed in joint session to conclude a final version of the documented plan.

Testing the plan is typically conducted after there is reasonable assurance that all elements of the recovery strategy have been implemented, such as additional equipment, backup communications and file rotation schedules.

Organizing a test scenario that utilizes only off-site files and documents is not that difficult, given a little time and a staff of good planners. What is difficult to determine is how best to utilize a test to ensure wide acceptance and support of the plan in years to come. Visions of DP personnel overloaded with assignments — who may have indicated interest in the plan but who have not demonstrated that interest — come to mind. Sure, a test can be conducted, but if no forethought is applied, hardly anyone in the organization can benefit from the test. It can result in nothing more than having two or three people proceeding to the alternate site, loading off-site tapes, running the selected applications and reporting the results.

Let's get smart. Use this opportunity to test the newly developed plan in a way that will educate and inform multiple groups in the company about the plan. Think in terms of a tactical exercise, with a well-defined test scenario. The test will be simulated for this first round. The scenario will outline a specific, believable disaster that has occurred. The disaster enables the test planner to develop a multitude of problem statements that must be worked out by the recovery teams. A wall clock can be used to depict a progression of time over a three- to five-day period. The actual exercise may only require five to six hours.

Two to three user departments can be invited to participate. Make sure the users represent the most critical applications systems. Invite the senior officer who authorized the expense for the plan development and the recovery strategy. Complement the senior officer with others such as the internal auditing manager and the chief financial officer. Senior management can be the evaluation team.

Obtain an open space area isolated from the daily business environment and provide tables for each team or group. State that the rule for communication between tables is by written message — not verbal. Assign secretaries, clerks, operators and similar staff as runners. Announce at the beginning of the exercise that two or three key team members have been incapacitated by the interrupting event. No, they cannot go home. They will become referees to ensure that the rules are followed.

Begin the exercise. As teams begin to work through the scenario problems and write messages to each other, the runners take the messages to the addressees and to the evaluation table. The evaluation table is the recipient of all messages; thus, it is in a position to know how overall play is proceeding. And it won't be long before one of the users develops an urge to probe with, "When are you bringing my application up?"

Any DP manager electing to try this type of exercise for a newly developed plan has better than a 50% chance that the plan will "live" for a long time. The results of such tests have proven to be successful in educating data processors, users and senior managers alike on the complexities of a recovery plan.

In plain English, it's salesmanship. For a plan to be successful, it has to be sold. The old adage, "A problem well stated is a problem half solved" is appropriate. A manager who knows how to sell a disaster recovery plan has half the battle won at the outset. ■

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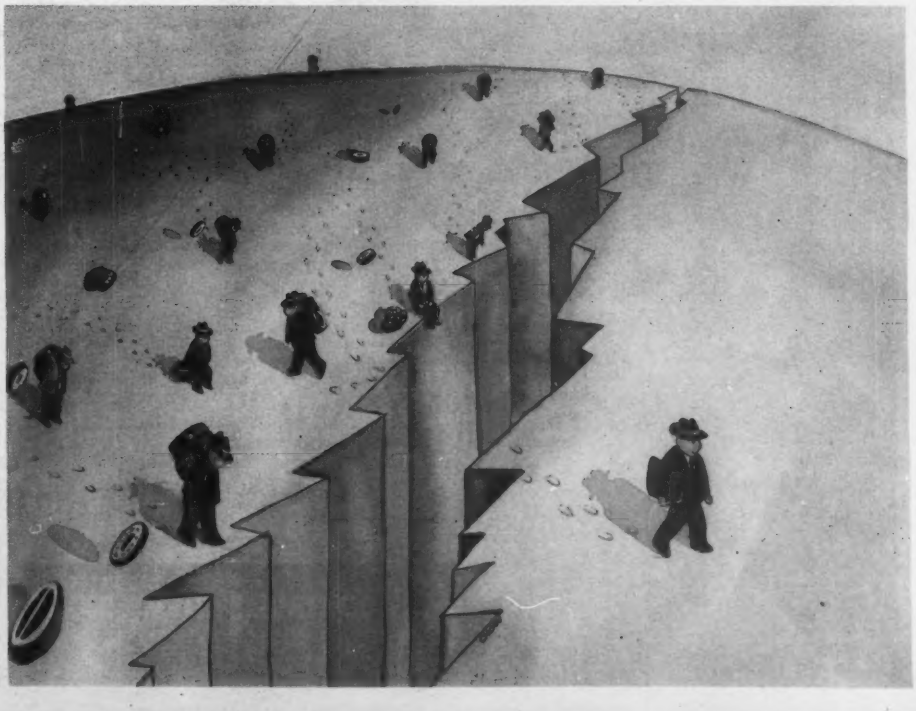

DISASTER RECOVERY HOT SITES

ARKANSAS

Systematics, Inc.
4001 Rodney Road
Little Rock, Ark. 72212

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4381, shell is 5,000-sq-ft computer-ready space, 12,000-sq-ft office space with programmers' cubicles
Data and Telecommunications: 150 phone lines, two modems; 31 terminals can be sent to client's site
Site Security: 24-hour force, card keys, closed-circuit TV
Test Time: Yes, up to 8 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes, subscription includes disaster recovery plan
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $900 to $3,000/mo
Term of Contract: Usually five years, one year and others available
Initiation Fee: $10,000 to $15,000
Per Diem/Usage Charge: $150 to $300/hour/CPU; 15 cents/sq-ft/day for shell

TOTAL SUBSCRIBERS PER CENTER: 32 current — hot, 60 maximum; eight current — shell, 100 maximum

COMMENTS: Proof operator backup and IBM 3890 and 1419 readers, sorter available for standby check processing

CALIFORNIA

Comdisco Disaster Recovery Services, Inc.
6400 Shafer Court
Rosemont, Ill. 60018

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3033 and 4341, 5,600-sq-ft office and storage space
Data and Telecommunications: Comline 2, 300 to 9.6K bit/sec. modems, 900 wire pairs
Site Security: Badge access system
Test Time: 32 to 48 hour/year, additional available

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,450 to $13,000/mo — hot site
Term of Contract: One to five years
Initiation Fee: $10,000 to $50,000 — hot
Per Diem/Usage Charge: $2,500 to $20,000/day — hot site

TOTAL SUBSCRIBERS PER CENTER: 60 current, 100 maximum — hot site

COMMENTS: Contact vendor for cold-site pricing; site will be replaced by San Ramon, Calif., site in mid-1986

COLORADO

Security Pacific Information Systems, Inc.
1401 Del Norte St.
Denver, Colo. 80221

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM [illegible] series, 4300 series; contact vendor for specifics; conference rooms and work space available
Data and Telecommunications: Yes
Site Security: 24-hour personnel, card keys, security cameras
Test Time: Yes, depending on contract

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,600 to $5,000/mo, depending on CPU and contract
Term of Contract: One, two or three years
Initiation Fee: Yes
Per Diem/Usage Charge: Yes

TOTAL SUBSCRIBERS PER CENTER: Not available

COMMENTS: Not available

CONNECTICUT

Cadre, Inc.
Box 687
19 Ensign Drive
Avon, Conn. 06001

TYPE OF SERVICE: Hot and cold sites
SITE CHARACTERISTICS:
Host Computer(s) Supported: Burroughs B4955, B4890, B3955
Data and Telecommunications: 50 circuits, voice and data, modems available
Site Security: American District Telegraph security system
Test Time: One day/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes, 24-hour services
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $550 to $3,500/mo — hot site
Term of Contract: One to three years
Initiation Fee: Yes, refundable
Per Diem/Usage Charge: $125/hour, some or all included in initial fee

TOTAL SUBSCRIBERS PER CENTER: 28 for both, 53 maximum

COMMENTS: No separate initiation fee for cold site, media services available

HAWAII

Data Processing Security, Inc.
200 E. Loop 820
Fort Worth, Texas 76112

TYPE OF SERVICE: Cold site (will be hot site in October 1986)

Continued on page 64

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If your customers have been telling you that diesel backup power is "high cost insurance," it's time you advised them to take another look!

A K/W diesel backup system can pay for itself in reduced utility costs, while providing the critical long-term power protection your clients need.

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The new K/W "Diesel Generator Control System," makes it possible to take advantage of utility-sanctioned "Load Curtailment" and "Peak Shaving" programs by providing the automated control, paralleling, and utility protection features necessary for interconnection with the utility.

Standard Modules

This modular, computer-based system automatically parallels the output of the customer's diesel generators with the utility, and allows for complete load management flexibility.

Voluntary Load Curtailment

In periods of high grid demand, the utility may initiate a "Voluntary Load Curtailment," in which the customer's diesels are automatically started and paralleled with the utility. The system then shares a pre-determined percentage of the load between the utility and the customer's diesel generators.

Peak Shaving

The automatic "Peak Shaving Mode" allows the customer to share a portion of his load with the standby diesel generators whenever his demand exceeds a pre-set level, thereby reducing demand charges during periods of peak energy use.

Long-Term Protection

Should utility power fail, the system automatically starts the diesels and transfers the load from the utility to the standby generators. When power is restored, the load is automatically transferred back to the utility. And all transfers are made without interruption of power to the load.

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The system continuously monitors utility power usage and cost, and computes net savings realized from the load management program.

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Whatever your processing environment, CDRS has a service and support structure to maximize your disaster preparedness. Our demonstrated success in supporting customers during actual disaster situations is testimony to our leadership in the industry. We invite you to take a closer look at our capabilities . . . and take the first step toward putting the world's leading disaster recovery resource to work for you.

COMDISCO®

Comdisco Disaster Recovery Services, Inc.®

Comdisco Disaster Recovery Services, Inc., 6400 Shafer Court, Rosemont, IL 60018, 312/698-3000

Continued from page 62

SITE CHARACTERISTICS:
Host Computer(s) Supported: 6,000-sq-ft raised floor, 2,000-sq-ft office space, will add IBM 4300 in October 1986
Data and Telecommunications: 300 data pairs
Site Security: Badge controls, alarmed doors, closed-circuit TV, fire protection
Test Time: 24 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,750/mo — future hot site, $1,250/mo — cold site
Term of Contract: Three years — hot, seven years — cold
Initiation Fee: No
Per Diem/Usage Charge: $100/hour — future hot site, $1.25/sq ft — cold site

TOTAL SUBSCRIBERS PER CENTER: 130 total at six sites, 100/site maximum

COMMENTS: Members have access to all sites; will open new sites in Georgia, Florida and Illinois in mid-1986 with Univac and IBM CPUs

ILLINOIS (Chicago)

Sungard Recovery Services, Inc.
1285 Drummers Lane
Wayne, Pa. 19087

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3083 Model J, 3081 Model K; 4,000-sq-ft office space; facility will be enlarged by June 1987 to double capacity
Data and Telecommunications: 120 dial-up lines; 1,800/2,100 bit/sec. twisted-pair cable
Site Security: Card key access, closed-circuit TV, 24-hour guards
Test Time: 32 to 48 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $3,100 to $9,200/mo — hot site
Term of Contract: One to five years, four-year average
Initiation Fee: $25,000 declaration fee
Per Diem/Usage Charge: $4,500 to $8,000/day — hot site

TOTAL SUBSCRIBERS PER CENTER: 380 current Pennsylvania and Illinois total, 440 maximum both sites total

COMMENTS: Will be adding site in California; check service available, including magnetic ink character recognition, proof encoding, check transaction, check clearing

ILLINOIS (Schaumberg)

Digital Equipment Corp.
146 Main St.
Maynard, Mass. 01754

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: DEC VAX-11/780, PDP-11
Data and Telecommunications: Tymnet/McDonnell Douglas Network Systems' Tymnet, communications links
Site Security: Electronic access system
Test Time: 32 hour/year, minimum 2 test/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes, separately priced
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $2,500/mo
Term of Contract: Not available
Initiation Fee: $3,000
Per Diem/Usage Charge: $1,000 to $2,500/day, limit 30 days

TOTAL SUBSCRIBERS PER CENTER: Not available

COMMENTS: Special recovery insurance available

ILLINOIS (Wood Dale)

Comdisco Disaster Recovery Services, Inc.
6400 Shafer Court
Rosemont, Ill. 60018

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4341, 3083, 3084 and 3081; 13,000-sq-ft office and storage space; standby check processing systems
Data & Telecommunications: Comline 2; 300 to 9.6K bit/sec. modems
Site Security: Yes
Test Time: 32 to 48 hour/year, additional available

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,450 to $13,000/mo — hot site
Term of Contract: One to five years
Initiation Fee: $10,000 to $50,000 — hot
Per Diem/Usage Charge: $2,500 to $20,000/day for hot site

TOTAL SUBSCRIBERS PER CENTER: 150 current total, 100 maximum per hot site

COMMENTS: Contact vendor for cold-site pricing

INDIANA

Data Processing Security, Inc.
200 E. Loop 820
Fort Worth, Texas 76112

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Burroughs B1900, IBM 4300; 8,000-sq-ft raised floor; 8,000-sq-ft office space
Data and Telecommunications: 300 data pairs
Site Security: Badge controls, alarmed doors, closed-circuit TV, fire protection system
Test Time: 24 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY: **Subscription Rates:** $1,500/mo — hot site, $1,000/mo — cold site
Term of Contract: Three year — hot site, seven-year — cold site

Continued on page 81

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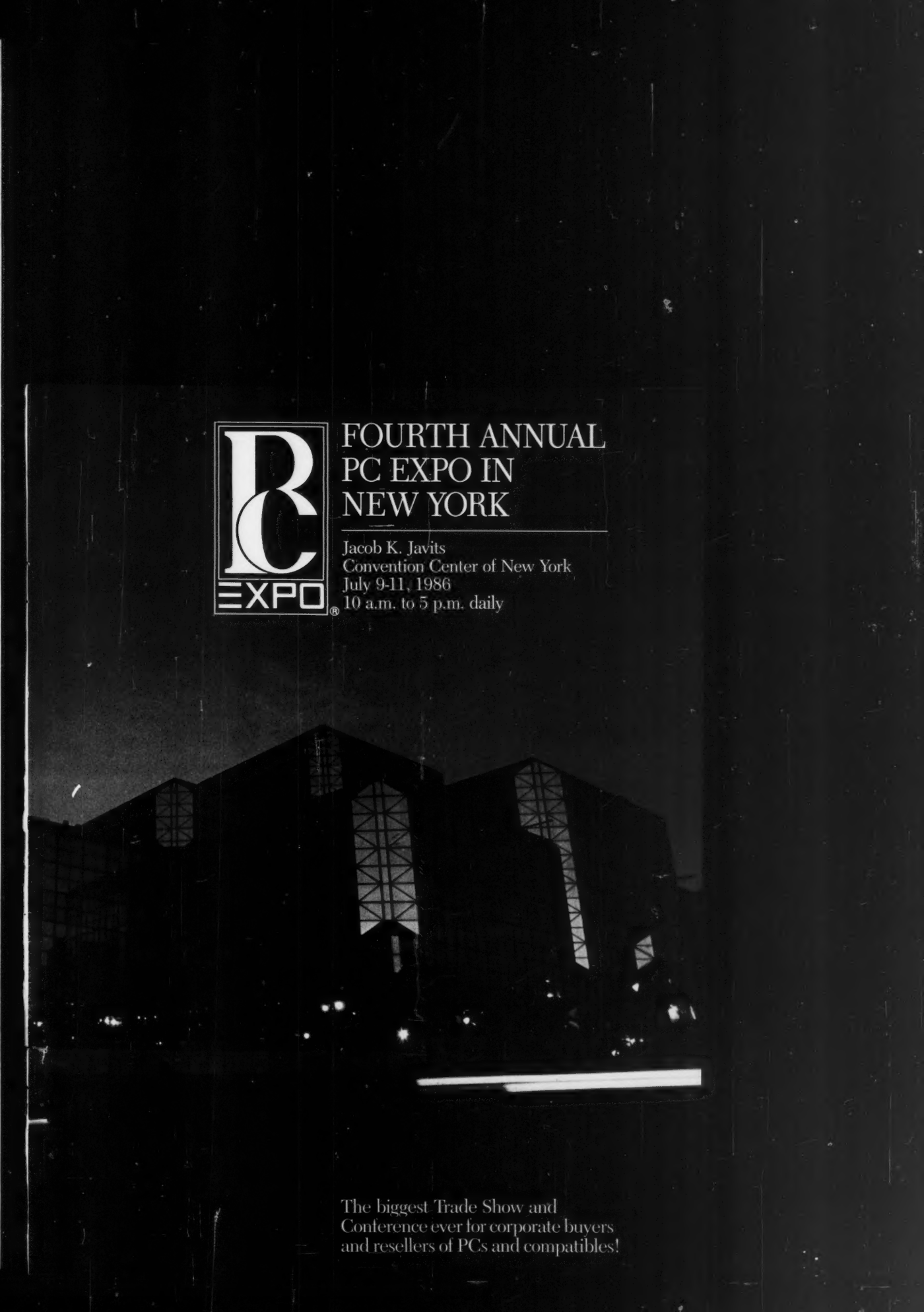
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Conference ever for corporate buyers
and resellers of PCs and compatibles!

If you want to see everything in IBM compatible systems—in one place at one time—
there's only one computer industry trade exposition you can't afford to miss.

THE FOURTH ANNUAL

PC EXPO is *the* microcomputer industry trade show that brings together major vendors of PC-compatible hardware, software and services with corporate volume buyers and resellers. This show is designed to give qualified decision-makers, like yourself, the time to meet with primary vendors and talk business without distraction.

PC EXPO provides you with the ease of "salon buying" rather than the havoc of fighting with crowds of literature-collecting non-buyers found at non-focused events. Only at PC EXPO are you able to gather the information you need in order to make informed PC buying decisions.

PC EXPO is for corporate buyers who manage, direct and maintain micros in quantity, and all resellers buying in volume. It is the only microcomputer industry trade event that attracts the vast majority of the country's top PC-purchasing firms. PC EXPO attendees know that PC EXPO delivers a group of more than 400 "pre-focused" vendors unlike any other computer trade show in the world.

Buyers from top accounting firms to dealer organizations attend PC EXPO and regard it as the one computer trade show they cannot afford to miss in order to see everything that's new and what works in the PC-compatible industry.

Similarly, third-party resellers who buy in volume don't have to sift through exhibits having nothing to do with the PC-compatible market. PC EXPO is set up to maximize buyer convenience; it's the one PC trade show that doesn't require a dealer to walk miles of aisles to see the products... and the people... that he needs to see. All without having to deal with crowds of hackers and hobbyists. Take your time and cover the entire show at a self-set pace, without using a week to do it!

Who should attend PC EXPO? The answer is—volume buyers!

PC EXPO is for OEM's, system houses, software developers, dealers, distributors, value added dealers, turnkey systems developers, consultants, office products dealers, manufacturer's reps, and other volume resellers.

PC EXPO IS FOR CORPORATE BUYERS. If your organization uses PCs and your opinion is crucial to the buying process, here's some good news: PC EXPO has been conceived, planned and executed for you. PC EXPO is the volume-market trade show where principal vendors are the *only* exhibitors. You discuss your needs and make your deals with the original producers of the products being sold: no "middle-men" exhibits!

42 of these firms know PC EXPO is tops. Join them in seeing everything you need in the PC universe.*

1. General Motors
2. General Electric
3. Westinghouse
4. Citicorp
5. Du Pont
6. Ford Motor Co.
7. Pacific Bell
8. Chase Manhattan Bank
9. Exxon
10. Peat, Marwick, Mitchell
11. United Technologies
12. McDonnell Douglas
13. Hughes Aircraft
14. Aetna Life & Casualty
15. TRW
16. Boeing
17. Sperry
18. General Dynamics
19. Travelers
20. Merrill Lynch
21. Dun & Bradstreet
22. Touche Ross & Co.
23. 3M
24. Intel
25. Security Pacific
26. Lockheed
27. Allied Products
28. Chevron
29. Union Carbide
30. Mobil
31. PG&E
32. Chemical Bank
33. Time
34. J.P. Morgan & Co.
35. American Can
36. Wells Fargo
37. Upjohn
38. Northwestern Mutual
39. LTV Steel
40. Pillsbury
41. General Mills
42. Nabisco
43. Federal Express
44. R.J. Reynolds
45. Bechtel
46. Teledyne

*list of top 46 PC-purchasing firms compiled by *Infoworld*, 1985, based on number of installed microcomputers.

What kind of corporate buyer attends PC EXPO? 1985 Attendance Breakdown: Company Type and Percentage of Corporate Total

Accounting firm	3.6
Advertising	2.3
Banking	8.3
Communications	5.7
Construction architects	.7
Credit	.4
Education	5.3
Engineering	2.9
Government/Military	5.3
Hospital/Health Care	1.6
Hotel	.2
Industrial Design	.4
Insurance	7.4
Law Office	.8
Management Consultant	1.0
Manufacturing	19.9
Publishing/Television	3.9
Real Estate	1.4
Research/Development	8.1
Retail Sales	1.8
Securities/Brokerage	2.5
Transportation (all)	3.1
Utility	1.5
Wholesale/retail sales	2.7
Other	9.1

PC EXPO IN NEW YORK

If it's worth seeing, it's at PC EXPO
Resellers and corporate volume buyers alike know what to expect at PC EXPO: principal vendors and principal vendors only. For our 1986 New York show, over 400,000 square feet will be dedicated to your PC interests: networking, graphics, printer technology, communications, CAD/CAM, R&D and hundreds of other state-of-the-art applications, as well as maintenance and training. New products? Last year, over 150 new products were introduced at PC EXPO; this year that number will double. You will see and learn more about the PC-compatible market in one day at PC EXPO than you could after months of research elsewhere.

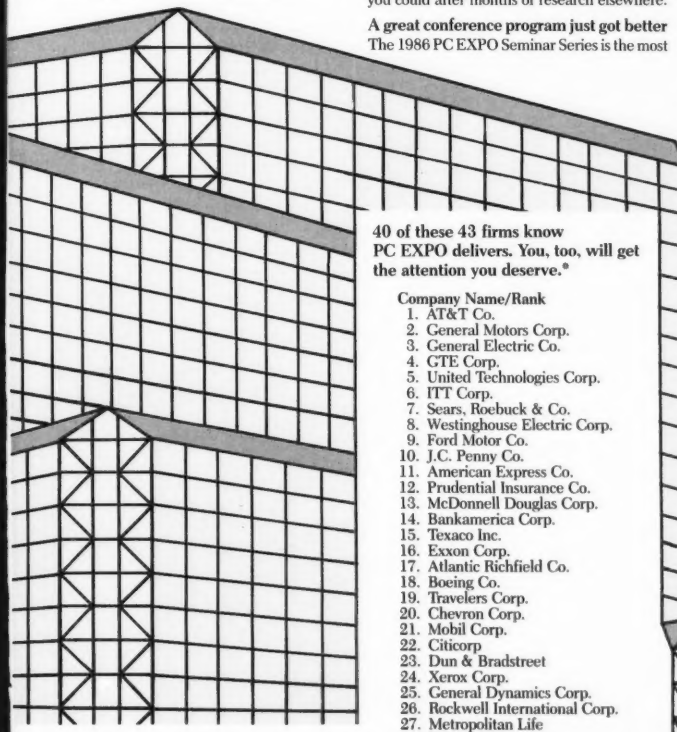
A great conference program just got better
The 1986 PC EXPO Seminar Series is the most comprehensive and informative free computer conference program in the country. Shaped by a 19-member advisory board drawn from the ranks of PC EXPO attendees, the series offers dozens of genuinely high-tech, sophisticated and educational papers, panel discussions and addresses. The details are inside.

"The definitive architectural achievement of the 80s"
That's how critics are describing the Jacob K. Javits Convention Center, the new home of PC EXPO designed by internationally acclaimed architect I.M. Pei. This extraordinary facility offers every conceivable exposition amenity and is a stunning new presence on the New York landscape.

All this and Lady Liberty, too
Finally, PC EXPO opens right on the heels of what will be the country's single most extravagant event of this decade: the rededication and centennial of the Statue of Liberty. The July 4th Liberty Weekend celebration will be going strong after the initial crowds have departed, and PC EXPO attendees will be able to enjoy leisurely visits to many of the OpSail tall ships and the Statue itself before and after the show.

Plan your visit now
The Fourth Annual PC EXPO in New York is the one computer trade show that is meaningful for you, as well as a pleasure to attend. Register now. In addition to saving time and money, you'll avoid waiting on long registration lines at the show. If we receive your registration by June 19th, we'll send you your badge in advance. We'll also mail you the first issue of the PC EXPO Show Daily, a valuable and informative planning guide to the show's activities.

We look forward to welcoming you to your show.



40 of these 43 firms know PC EXPO delivers. You, too, will get the attention you deserve.*

Company Name/Rank

1. AT&T Co.
2. General Motors Corp.
3. General Electric Co.
4. GTE Corp.
5. United Technologies Corp.
6. ITT Corp.
7. Sears, Roebuck & Co.
8. Westinghouse Electric Corp.
9. Ford Motor Co.
10. J.C. Penny Co.
11. American Express Co.
12. Prudential Insurance Co.
13. McDonnell Douglas Corp.
14. Bankamerica Corp.
15. Texaco Inc.
16. Exxon Corp.
17. Atlantic Richfield Co.
18. Boeing Co.
19. Travelers Corp.
20. Chevron Corp.
21. Mobil Corp.
22. Citicorp
23. Dun & Bradstreet
24. Xerox Corp.
25. General Dynamics Corp.
26. Rockwell International Corp.
27. Metropolitan Life
28. Tenneco Inc.
29. Household International Corp.
30. American General Corp.
31. Amoco
32. Cigna Corp.
33. E.I. du Pont de Nemours & Co.
34. UAL Inc.
35. Allied Corp.
36. Lockheed Corp.
37. United Telecommunications Inc.
38. Texas Instruments Inc.
39. TRW Inc.
40. Security Pacific Corp.
41. Goodyear Tire & Rubber Co.
42. Motorola Inc.
43. Automatic Data Processing

*list of top computer-using firms compiled by *Informationweek* based on MIS value of at least $50 million.

What kinds of resellers attend PC EXPO? 1985 Attendance Breakdown: Reseller Type and Percentage of Reseller Total

Consultant	15.6
Dealer/Distributor	34.2
OEM	5.6
Office Products	3.1
Service Vendor	2.6
Software Developer	12.0
Systems House	7.1
Turnkey Vendor	3.6
VAD/VAR	7.9
Other	8.3

SEMINAR SERIES at a glance

The most comprehensive free computer conference program in the country!

PC EXPO has given super status to its free conference sessions for 1986. Advised by a 19-member board comprised of industry leaders from the corporate volume buyer market, volume resellers, the media and independent consultants, PC EXPO has put together a Seminar Series acutely responsive to its attendees and second-to-none in the computer trade show industry. Conferences and presentations covering the entire gamut of PC-related topics will be given by acknowledged experts in every conceivable PC field. If there's anything you need to know or learn about what's new and what works, what's hot and what's not, you will find it detailed, demystified, demonstrated and delivered at one program only—the free PC EXPO 1986 Seminar Series.

Advisory Board

Roger Bender, assistant vice president, Citibank, and vice president, Microcomputer Managers Association; Keith Bennett, PC specialist, Skadden Arps, Slate, Meagher & Flom; John Russell, managing editor, *Computer Retail News;* J. Scott Briggs, publisher, *PC Week;* Vincent DiPaola, CPA, systems manager, Rogers and Wells; Esther Dyson, publisher and editor-in-chief, *Release 1.0;* Alan Gross, technology planning specialist, Smith Barney, Harris Upham Company, Inc.; R. Bruce Johnson, manager, PC resource center, Deloitte, Haskins & Sells; Alex Kask, senior manager—computer audit, Ernst & Whinney, and president, Microcomputer Managers Association; Karl Kendall, project manager, information center, Metropolitan Life; Bill Machrone, editor, *PC Magazine;* Paul Marentette, manager of con-

WEDNESDAY JULY 9TH

	ROOM A	ROOM B	ROOM C	ROOM D	ROOM E
11:00	PC EXPO Keynote Address				
11:30					
12:00	Compatibility Issues in Enhancement Products		PC Training in Corporate America	The Information Center—A Case History	Avoiding Computer Nightmares
12:30					
1:00	Site Licensing Panel		Multi-Processor Micro-Systems Challenge Minicomputers	The Direct Sales Dilemma	Purchasing Decisions Using LAN Standards & Benchmarks
1:30		A Technical Presentation By IBM, for Independent Hardware and Software Developers, Concerning IBM PC Products and Enhancements			
2:00			Micro-Computer Service and Repair		Managing Personal Computing: What's Hot, What's Not
2:30					
3:00	Graphics: What's Now, What's Next		Voice Recognition: Less Talk and More Action	Choosing a Local Area Network: A Multi-Faceted Decision	Issues and Alternatives Of Micro-To-Mainframe Connections
3:30					
4:00					
4:30					

THURSDAY

	ROOM A	ROOM B
10:30		A Technical Presentation By IBM, for Independent Hardware and Software Developers, Concerning IBM PC Products and Enhancements
11:00	Portable Computers: Solutions Finally Finding Application	
11:30		
12:00		
12:30		
1:00	Information Management for Corporate Decision Makers	
1:30		
2:00		
2:30		
3:00	Multi-User Systems and LANs: How They Fit Into a Company's Plans	
3:30		
4:00		
4:30		

sulting services, Equitable Life; Anthony Morris, chairman and CEO, Morris Decision Systems, Inc.; Tim Scannell, editor-in-chief, *PC Products*; Andrew M. Seybold, president, The Seybold Group, Inc.; Gene Talsky, president, Professional Marketing Management, Inc.; Rich Thoma, president, People & Technology, Inc.; Frank Vulpis, project manager—micros, Merrill Lynch, Pierce, Fenner and Smith, Inc.; and Jack Weingarten, manager of micro-services, Shearson Lehman Brothers.

PC EXPO Keynote Address

Wednesday, July 9, 11:00-11:50, Room A

John V. Roach
Chairman of the Board,
Chief Executive Officer
and President
Tandy Corporation/
Radio Shack

Mr. Roach, who began his career at Tandy as the data processing manager 19 years ago and has been closely associated with its microcomputers since their introduction in 1977, will speak on several key areas concerning the PC's evolution and future in the overall computer industry. He will specifically address timely topics and current trends in the industry and place them in a perspective relevant to PC EXPO's unique focus. Mr. Roech's keynote will emphasize the PC options and directions applicable to corporate volume buyers and large resellers. In addition, he will offer insightful assessments and observations gleaned from his many years as CEO of one of the nation's most visible high-tech corporations.

JULY 10TH

ROOM C	ROOM D	ROOM E
The Role of Management in Securing Computer Systems	Migration Paths and Time Bombs	The Write Stuff: A Word Processing Panel Discussion
Customized Microcomputer-Based Enhancement Products		
The System/36 and Networked PCs: A Hands-On Comparison	Electronic Printing: A Demystifying Look at the Options	Forces of Change in the Microcomputer Industry
Automation of the System Development Process		Software Buying Plans of Corporate PC Users
Micro-To-Mainframe Communications: The Industry Catches Up	On-Line Meetings: A Telecommunications Application With a Competitive Edge	Project Management Using Microcomputers

FRIDAY JULY 11TH

	ROOM A	ROOM B	ROOM C	ROOM D	ROOM E
10:30		A Technical Presentation By IBM, for Independent Hardware and Software Developers, Concerning IBM PC Products and Enhancements			
11:00	Graphics in Word Processing and Database Applications		Presentation on the State of the Industry	Corporate Computer Training: An Integrated Approach	Office Automation From the Bottom Up
11:30					
12:00	Computer Contracts—Upgrades, Support, and Service			PCs And Expert Systems: Costs/Benefits	Handling Dissimilar Data Using a Chart of Accounts
12:30					
1:00	What Makes an Information Center Tick?		Computer Security: Is Your System Safe and Sound?	LANs: Assessing User Needs	Micro-To Minicomputer Communications: An Overview
1:30					
2:00					
2:30	Beyond Keyboard Entry: Options in Data Input		CAD/CAM, Candidly	Memory Storage: Past Dreams/Future Visions	The Revolution in PC Publishing
3:00					
3:30					
4:00					

Program subject to change without notice.

SEMINARS in depth

Leland Strange
President & Chief Executive Officer
Intelligent Systems Corp.

Wednesday, July 9, 12:00-12:50, Room A

Compatibility Issues in Enhancement Products

Enhancement products should all work together, be fully functional and work for future compatibility. These are just some of the many issues that will be addressed by Mr. Strange. Other topics include: development and adherence to microcomputer and peripheral standards; reliability of enhancement products, back-up and service; and the competitive cost of enhancement products. Mr. Strange will also discuss how more compatibility testing, greater cooperation between manufacturers, and standardization of products to meet IBM/other's specifications are being addressed by manufacturers. He will then illustrate the improved compatibility of new enhancements and point the way to compatibility standards for the future.

Enrique Crespo, Jr.
Manager of Personal Computers
The Torrington Company

Wednesday, July 9, 12:00-12:50, Room C

Personal Computer Training in Corporate America

Mr. Crespo will explore problems arising from the introduction of the personal computer into corporate campuses and the subsequent requirements for managerial computer literacy. One of the keys to increasing utilization of the PC is by training the PC operator to be a more confident and creative individual. The introduction of in-house PC literacy programs in the business world has presented a new series of challenges to the corporate trainer, as well as to the data processing department. Among the key issues that need to be examined and will be discussed are: training requirements of senior managers, motivation in computer training, cost of training resources, in-house training versus outside training, hiring of training staff, and corporate training goals.

Charles J. Liszcz
Manager, Information Center Department
Computer Sciences Corp.

Wednesday, July 9, 12:00-12:50, Room D

The Information Center—A Case History.

This case study presentation will address the problems encountered and the solutions implemented in what has been discerned as being two distinct phases within an IC's growth. The first phase involved the selling of the idea to management, starting up, and operating for the first 8 to 10 months. The second phase involved the broadening of areas of responsibility, documentation, employee stress and burnout, and the advent of the knowledgeable end user. This phase continues through at least two years of an IC's existence. For both phases, methods and criteria for measuring success will be presented. Projections as to what the future holds for the IC, its management and staff will conclude the session.

Howard Hillman
Author, Lecturer and Consultant

Wednesday, July 9, 12:00-12:50, Room E

Avoiding Computer Nightmares

"Hillman's Law" is a simple yet often overlooked principle: A fool learns by his own mistakes; a wise man learns from the mistakes of others. Most seasoned PC buyers and managers have learned this wisdom the hard way, making the same costly mistakes previously committed by others. Had they known of the misfortunes of the past, they could have sidestepped headaches, eliminated downtime and saved thousands of dollars. Mr. Hillman helps PC buyers avoid such costly mistakes by describing real life horror stories that cover a broad sweep of topics. Mr. Hillman will conclude his seminar by asking the audience to share their own favorite horror stories.

Moderator:
E. Drake Lundell, Jr.
Publisher/Editor-in-Chief
InformationWeek

Wednesday, July 9, 1:00-2:50, Room A

Site Licensing Panel

Site licensing is an issue whose time has come. As personal computer software suppliers increase sales to the corporate marketplace, they must meet increasing demands to offer site licensing programs. Several users have recently chosen software suppliers based on site licensing policies. This panel—which includes users from several large organizations, vendors who offer site licensing and vendors who do not—will explore the issue from both vendors' and users' viewpoints.

panel members

Karen Orton
Director of Corporate and Commercial Marketing
Ashton-Tate

Theodore Klein
President
Boston Systems Group, Inc.;
President
Society for Management of Professional Computing

Michael Crosno
Vice President of Marketing
Computer Associates

Marty Sahey
Manager of Sales Planning
Lotus Development Corp.

Howard W. Newkirk
President
PowerBase Systems, Inc.

Alan Gross
Technology Planning Specialist
Smith Barney

Charles Grant
Chairman of the Board
North Star Computers, Inc.

Wednesday, July 9, 1:00-1:50, Room C

Multi-Processor Micro-Systems Challenge Minicomputers

Microcomputer and minicomputer systems manufacturers are vying for the multi-user business applications market. The key technical requirement facing these manufacturers is multiple user access to shared information and shared peripherals without causing errors or delays in response times. Historically, this multi-billion dollar market has been the province of minicomputer manufacturers. Mr. Grant will discuss how a number of microcomputer companies are creating significant inroads into this domain. The new multi-processing microcomputer systems — often referred to as "super micros" — are meeting customer expectations in the areas of response times, storage capacity, reliability, system features and applications. In certain areas, notably expandability, price/performance and graphics, these multi-user microcomputer systems are now *surpassing* minicomputer capabilities.

Moderator:
John Russell
Managing Editor
Computer Retail News

Wednesday, July 9, 1:00-2:50, Room D

The Direct-Sales Dilemma

Whenever a manufacturer's strategy involves distributing products to value-added resellers while also employing a direct-sales force, controversy is certain to erupt. VARs will complain that such a marketing plan is contradictory and, ultimately, usurps their ability to compete in high-end business environments. Manufacturers, on the other hand, insist that enough potential revenue exists in the Fortune 1000 community for both their own direct-sales forces and VARs to enjoy attractive sales. This discussion will pull together the key components of this argument. A panel of vendors, VARs and corporate computer managers will exchange their views in this forum, chaired and sponsored by Computer Retail News.

panel members

Ed Ramos
President
Future Information Systems, Division Computone

Anthony Morris
Chairman and CEO
Morris Decision Systems, Inc.

Ray Noorda
President
Novell

Wednesday, July 9, 1:00-1:50, Room E

Purchasing Decisions Using LAN Standards and Benchmarks

Local area networks are more powerful, more secure and more flexible than ever before. Although hardware selection is still important in LAN decision-making, perhaps it is no longer a standardization issue. DOS 3.1, however, has become the heart of the LAN standard issue. DOS 3.1 requires a file server environment, and any multi-user software package written for DOS 3.1 will run on any LAN that supports DOS 3.1. This standardization will elicit more multi-user software applications and, probably, swell the ranks of companies who have upgraded to DOS 3.1 compatibility. With this maturity and standardization, LANs are moving into many new areas. Thus, benchmark test results can be an invaluable tool in choosing the right network for your particular situation and application.

Thomas F. Nolan
Vice President Western Region
Sorbus

Wednesday, July 9, 2:00-2:50, Room C

Microcomputer Service and Repair

Microcomputers, no matter how good they are, will eventually require maintenance service. As businesses become more dependent on cost-effective computing, they are recognizing the need for timely and skillful equipment maintenance to avoid unnecessary downtime. Mr. Nolan will discuss three sources for computer maintenance: the OEM, an in-house operation or a third-party service organization. Additionally, he will examine in detail the repair options available such as on-site, carry-in, ship-in, or van pick-up/delivery. Mr. Nolan will also discuss the multi-vendor repair dilemma and advise users on how to reduce unnecessary downtime and service calls by following some basic preventive maintenance steps.

Naomi Karten
President
Karten Associates

Wednesday, July 9, 2:00-2:50, Room E

Managing Personal Computing: What's Hot, What's Not

Micro-managers have been swamped by user demands for training and support. User expectations are growing. Technological advances are continuing non-stop. Management is calling for more proof of benefits. The pace is a hectic one. These factors make it a challenge to manage day-to-day operations without losing sight of broader business goals. This session will address strategies which contribute to successful management of personal computing, as well as factors which pose a threat to this success. Examples from the experiences of many companies will be used to illustrate "how to" and "how not to" in such areas as training, standards, vendor relations, application development, support services, and surviving and thriving in the midst of constant change.

Moderator:
Rich Thoma
President
People & Technology, Inc.

Wednesday, July 9, 3:00-4:30, Room A

Graphics: What's Now, What's Next

Graphics capabilities on microcomputers have come a long way in a short time, but it appears that a veritable explosion of new technologies will soon take place. The panel will discuss: today's existing industry standards; software drivers of graphics hardware; new graphics hardware, including new display technology and graphic co-processors; and presentation graphics capabilities and techniques.

panel members

Rich Bader
Co-Manager
Personal Computer Enhancement Operation
Intel

Daniel E. Foots
Customer Service Manager
CalComp Corporation

Jerry Cahn
CEO
Brilliant Image, Inc.

Moderator:
Debra Bulkeley
Executive Editor
PC Products

Wednesday, July 9, 3:00-4:30, Room C

Voice Recognition: Less Talk and More Action

Speech technology is not new. Production line workers have used voice systems for years to enter data into computers while their eyes and hands were busy elsewhere. But it is only recently that voice recognition systems are beginning to infiltrate the business environment. In this session, some of the leading vendors in the voice recognition market for the personal computer will discuss the current state of this technology, the problems they are facing in terms of business user acceptance, and the new trends and developments they anticipate will evolve in this provocative communications area.

panel members

S.J. "Jackie" Robinson
Plans and Control Manager-I/O Products
Entry Systems Division
IBM

James R. Moser
Senior Computer Scientist
Kurzweil Applied Intelligence, Inc.

David Greer
Product Manager
ITT

Jim Cook
Director of Marketing
Votan

Moderator:
Dan Spiner
Chief Executive Officer
Management Information Software , Inc.

Wednesday, July 9, 3:00-4:30, Room D

Choosing a Local Area Network: A Multi-Faceted Decision

This seminar will include presentations by corporate users and local area network vendors who will describe their experiences in selecting, installing and supporting LANs. The focus will go beyond a survey of what is available to detail the personal and managerial considerations in LAN installations and usage.

panel members

Rick Winokur
Management Consultant/
Project Office Director
Chase Manhattan Bank

Henry L. Kee
Vice President - Personal
Computing Architecture
Chemical Bank

Cornelius Peterson
President
Digital Products

Suri Harish
Director of Boardband
Product Line
Sytek

David Bryant
Chief Scientist
Waterloo Microsystems, Inc.

Moderator:
Irwin Greenstein
Senior Editor
PC Week

Wednesday, July 9, 3:00-4:30, Room E

Issues and Alternatives of Micro-to-Mainframe Connections

As the demand for distributed processing becomes more intense, MIS managers may find it increasingly difficult to find the right micro-to-mainframe solution. This seminar will establish the issues and alternatives confronting buyers seeking to connect PCs to mainframes. Experts from leading micro-to-mainframe vendors as well as a MIS manager from a major insurance company will offer answers to this complex demanding problem.

panel members

Jack Armstrong
Manager of Product
Marketing-Information
Center Products
Cullinet Software, Inc.

William H. Hiller
Product Line Director-
Micro Products
Digital Communications Associates, Inc.

Paul Marentette
Manager of Consulting
Services
Equitable Life

David Feldstein
Vice President of Micro
Products Division
Information Builders, Inc.

Moderator:
Gene Talsky
President
Professional Marketing Management, Inc.

Thursday, July 10, 11:00-12:50, Room A

Portable Computers: Solutions Finally Finding Application

The session will explore the growing use of portable computer systems, including both laptops and transportables, to meet three different needs: (1) single-computer users, who need to move their computers to and from their offices, to customer locations, and for whom the portable must offer all general purpose functionality and compatibility; (2) multiple-computer users, who have access to desktop systems in their offices but who need portables in field locations and branch offices; and (3) specialized applications, including remote data gathering, maintenance, sales, government, and military needs. Representatives from manufacturers and end users will address each of these types of portable users and define the product characteristics that best meet the needs of each. The panel will provide an update on how advances in technology are enabling portables to meet a wide array of needs.

panel members

Michael S. Swavely
Vice President of
Marketing
Compaq Computer Corp.

Sharon D. Cuppett
Product Manager
Datavue

Alan B. Lefkof
Vice President, Marketing
Grid Systems Corp.

Stewart Weinstock
Buyer for Portable and
Pocket Computers
Radio Shack

Andrew Czernek
Director of Marketing
Zenith Data Systems

August Bequai, Esquire

Thursday, July 10, 11:00-11:50, Room C

The Role of Management in Securing Computer Systems

Computer-related crimes now account for over $500 million in annual losses; with the proliferation of personal computers, computer networks, electronic message systems, and EFT systems, the problem will only continue to grow. The consensus among experts is that computer security can go a long way in curtailing the problem; by necessity, this means sensitizing management to the problem. Mr. Bequai will address management's role in computer security and will include: the scope/techniques employed by computer criminals, the role/objective of EDP security, and federal/state legislation on computer security and its portents for management.

Moderator:
Scott Briggs
Publisher
PC Week

Thursday, July 10, 11:00-12:50, Room D

Migration Paths and Time Bombs

It's a safe bet that nearly every piece of hardware and software used today will be outmoded within two years, yet there are many present configurations that will offer migration paths to the next generations. Which choices provide these migration paths and which may be future time bombs for the volume buyer will be the subject of this informative and relevant panel discussion. Panelists will be expressing their own, sometimes conflicting views on what is in store in the years to come. Audience participation will be invited.

panel members

John Dodge
Executive Editor/News
PC Week

Richard Duffy
Department Editor,
Editorial/Opinion
PC Week

Paul Gillin
Senior Editor
PC Week

Lois Paul
Executive Editor/
Features
PC Week

Sam Whitmore
Senior Editor
PC Week

Moderator:
John Dickinson
Special Projects Editor
PC Magazine

Thursday, July 10, 11:00-12:50, Room E

The Write Stuff: A Word processing Panel Discussion

panel members

Word processing has evolved from dedicated large scale equipment to personal computers in a very short time. That evolution has brought with it revolutionary changes in the way word processing software is designed, and in what it can do. Word processing software packages similar to the typewriter-oriented corporate products of the dedicated behemoths are still available, but today's personal computer buyer also has a choice among both faster-running professional programs and personal word processors that are designed with lighter word processing needs. Discussion panelists will look at what might be next in word processing software, from both the vendor and user viewpoints.

Robert F. Petrie
Vice President
Manufacturers Hanover Trust

Charles Stevens
Group Product Manager, PC Word Processing/ Communications
Microsoft

William Crowell
Vice President - Product Development
MicroPro International

Vincent DiPaola, CPA
Systems Manager
Rogers & Wells

W.E. "Pete" Peterson
Executive Vice President
Satellite Software International

Theodore Klein
President
Boston Systems Group, Inc.;
President
Society for Management of Professional Computing

Thursday, July 10, 12:00-12:50, Room C

Customized Microcomputer-Based Information Systems

As corporate microcomputer applications have grown more powerful, sophisticated and prolific executives are seeking new and better strategies for harnessing, coordinating, and leveraging PC technology to achieve organizational goals. One proven strategy is to consider an applications perspective and identify specific custom information systems which can be effectively delivered using microcomputer technology. This presentation will identify strategies and tactics by which different systems can be quickly identified, isolated, designed, and implemented using a variety of traditional development and prototyping methods.

Arun Gupta
Chief Executive Officer
Software Solutions, Inc.

Ashok Ahuja
Chief Operating Officer
Software Solutions, Inc.

Thursday, July 10, 1:00-2:50, Room A

Information Management for Corporate Decision Makers

Developed for the business executive inundated by vendor claims, this session will present approaches to transform general information into a decision support resource. Among the topics that will be reviewed are the requirements of data base management systems in the micro environment, the development of applications with a dbms, and distributing information within an organization using local area networks, micro-mainframe links and other communication methods. Members of this session, sponsored by Software Solutions, Inc., will include corporate users, an independent consultant, an editor of a prestigious trade publication and senior executives of Software Solutions, Inc.

Paul Nicolette
Program Development Specialist
Department of Environmental Protection
State of New Jersey

Thursday, July 10, 1:00-1:50, Room C

The System/36 and Networked PCs: A Hands-On Comparison

This presentation summarizes the continuing education of an information systems group confronted daily by questions such as: what belongs where, and what does experience teach about the relative merits of mini-based, stand-alone, local network and hybrid approaches. You will hear of problems solved and unsolved, of an attempt to find the applications for which each alternative solution is best suited, of benchmarks, pitfalls and future directions. In each case, user-style experience with delivered products is the point of reference.

Moderator:
Rich Thoma
President
People & Technology, Inc.

Thursday, July 10, 1:00-2:50, Room D

Electronic Printing: A Demystifying Look at The Options

panel members

With the rapid-paced introduction of new products, electronic printing and publishing has evolved from an emerging technology to nearly mature professional composition and production products. This panel discussion will explain such printing terms as "H & J" and WYSIWYG." Additionally, output technologies such as laser, ion-deposit, magnetic drum, electrostatic and thermal transfer printers will be discussed.

Stefanie Kott
Analyst and Consultant

Rich Treitman
Director of Product Marketing
Lotus Development Corp.

Michael Podanoffsky
President
Modtek, Inc.

Dr. Edward W. Savarese
Chairman and Chief Executive Officer
Personal Computer Products Inc.

Douglas S. Stivison
Director of Production and Technical Support
Scangraphic Dr. Boger, Co.

Andrew Seybold
President
Seybold Group, Inc.

Thursday, July 10, 1:00-1:50, Room E

Forces of Change in the Microcomputer Industry

Mr. Seybold will examine what is actually going on in the industry and try to make sense of it. He believes that through economic and competitive pressures, the microcomputer industry is entering an era of stability, versus an extended period that has been full of innovation and daring new concepts. What will be the impact? Has technology gone too fast? Have we arrived at a plateau? Mr. Seybold will discuss new chip development, directions in mass storage and continuing quests for greater densities, speeds, and miniaturization. He will also examine trends and developments in Asia and Europe, both as markets and as suppliers to U.S. volume buyers.

Conny Wylie
President
Conny Wylie Corp.

Thursday, July 10, 2:00-2:50, Room C

Automation of the System Development Process on the PC

The demand for information resources has become such a dominant concern in business today that software/application developers and management are constantly seeking new ways to improve system development productivity by increasing the volume of system development and the quality of the product. The evolution of PC-based programmer/analyst workstations, endowed with a software engineering methodology and its related computer-aided software engineering workbench tools, represents a complete framework for addressing the systems development productivity issue. Mr. Wylie will examine the emergence of these new analyst and programmer tools and discuss their wide-ranging applications.

William A. Gannon
Publisher
Software News

Thursday, July 10, 2:00-2:50, Room E

Software Buying Plans of Corporate PC Users

Mr. Gannon will summarize a survey of 2,000 PC users in large American companies. The annual Software User Survey reflects the intentions of mainframe, mini, and microcomputer software buyers. The micro software section presented in this session will include specific packages already installed, applications planned for automation, and vendors under consideration for 1986. User buying criteria (features, price, performance, documentation, etc.) are also explained and given priority order.

Moderator:
Dave Mahoney
President
Banyan Systems, Inc.

Thursday, July 10, 3:00-4:30, Room A

Multi-User Systems and LANs: How They Fit Into a Company's Plans

For many buyers at medium-sized companies and at the departmental level in larger corporations, a key PC option centers on implementing multi-user systems or on networking multiple PCs. Such plans often include integrating data resources into total corporate networks and looking at PCs, LANs, multi-user systems and other devices as shared resources. The "glue" that can bind them together is embodied in an emerging technology: network servers. This session will deal with how these sophisticated network servers can interconnect local or remote PCs, LANs, minis, mainframes, public data networks, other data resources and communication services into a unified corporate system.

panel members

Nigel Spicer
Director of Marketing
Alloy Computer Products

Erwin Nobel
Vice President-Operations
Anex Technology, Inc.

Bill Lanfri
Director of Marketing
Corvus Systems, Inc.

Moderator:
Bill Machrone
Editor
PC Magazine

Thursday, July 10, 3:00-4:30, Room C

Micro-to-Mainframe Communications: The Industry Catches Up

Micro-to-mainframe communication is a vital area of interest to corporate PC users. Radical changes on the PC side have been slowed by barely perceptible changes on the mainframe side, but there may be dramatic changes on the horizon. The panel will review the state of the art in 3278/3279 emulation, 3274 emulation, high-speed modems, protocol converters and concentrators. Panel members will also take a futuristic look at IBM's token ring, micro-to-mini communications, and the prospects for peer-to-peer communications under SNA. The panel will talk frankly about the abilities and shortcomings of existing products, and the prospects for new products to solve corporate communication and integration problems.

panel members

Charles Morel
Chief Executive Officer
CXI, Inc.

Jack Weingarten
Manager of Micro Services
Shearson Lehman Brothers

Norman Agin
Vice President
Martin Marietta Data Systems

Eric M. Schnek
President
Eric M. Schnek, Inc.

Moderator:
Susanna Opper
Telecommunications Analyst and Consultant

Thursday, July 10, 3:00-4:30, Room D

On-Line Meetings: A Telecommunications Application With a Competitive Edge

The move into the information age is rapidly changing the nature of business communication. Some pace-setting companies are using PCs and modems for on-line meetings about everything from developing new products to planning sales meetings. These rapid communication systems are giving their users an important competitive edge. But group electronic communication systems — sometimes called computer conferencing — like face-to-face meetings, require planning and facilitation. Panelists will focus on various applications, from national and global linking of work groups at large organizations to ways any group can assess problems and discuss solutions on-line. Ideal applications, weaknesses and strengths of the technology, and system decisions will also be addressed.

Moderator:
Harvey Levine
President
Project Management Institute

Thursday, July 10, 3:00-4:30, Room E

Project Management Using Microcomputers

This session will provide an opportunity for potential buyers to learn characteristics of project management. Topics to be addressed include: user training; ease-of-use vs. speed vs. functionality, and if all three can coexist in one product; the importance of computer resource leveling, compared with providing a good analysis of the resource loadings and availabilities; and, perhaps the weakest area in most programs, real user-defined report generators, where users can define format and content. Also to be discussed is where the project management industry is going, as well as what vendors interpret as the most desired user needs and how they are being addressed.

panel members

Chris Murray
President
Applied Business Technology Corp.

Robert E. Sculley
Vice President
Diversified Information Services, Inc.

Andrew Layman
President
Breakthrough Software Corp.

E. Richard Artus
Vice President-General Manager, Retail Group
Project Software Development Inc.

Mark Skiba
Vice President Research & Development
American Programmer's Guild, Ltd.

Friday, July 11, 11:00-11:50, Room A

Graphics In Word Processing and Database Applications

This presentation is an exploration of how today's PCs and printers can be used to produce higher informational quality through graphics. In just a few years, the technology has progressed from a choice of either physically cutting and pasting or buying an expensive workstation to a spectrum of PC solutions. Now choices range from specialized integrated hardware/software systems to the use of standard off-the-shelf packages with inexpensive memory-resident graphics and text integration software. Mr. Skiba's discussion will include a number of example applications, as well as a report on the current state of the art in PC hardware and software.

Rich Thoma
President
People & Technology, Inc.

Friday, July 11, 11:00-12:50, Room C

Presentation on the State of the Industry

Mr. Thoma will discuss and demonstrate presently available technology and prototype products, some of which will be seen for the first time. Observations of new products and technologies recently released in the United States will be made, as well as a thorough discussion of future products from Japan, Korea and Taiwan which were seen at trade shows and factory visits in those countries. Product areas that will be discussed include: CD-ROM; optical/digital storage; barium-oxide vertical recording; high-capacity disk drives; data-back up; high and ultra-high resolution display systems; the proliferation of the EGA; and thermal transfer, ion deposit and magnetic drum printers.

Ronnie Colfin
President
Edutrends, Inc.

Gary Audin
President
Delphi, Inc.

Friday, July 11, 11:00-11:50, Room D

Corporate Computer Training: An Integrated Approach

This session will explain in detail the merits of an integrated training curriculum and how this program should include seminars — both in-house and public — videotapes, computer-based training, self-study guides and books. Ms. Colfin and Mr. Audin will discuss the pros and cons of each method. Examples will focus on data communications and personal computer software training.

Steve Malisewski
Marketing Vice President
MicroAge Computer Stores, Inc.

Friday, July 11, 11:00-11:50, Room E

Office Automation from the Bottom Up

One challenge facing the computer industry today is to provide connectivity between individual PCs and both department-level PCs and larger systems within the company. With the "bottom-up" desire created by individual users, Mr. Malisewski believes true office automation can be achieved. This means automating such functions as voice, data, image and text processing at the office level. He will discuss the products available in these areas and developments that are on the horizon. Mr. Malisewski will also address micro-to-mainframe communications as neither a "top down" nor "bottom up" link between the office system and the personal systems that requires technical expertise for resellers and high-level support from the vendor.

Mitchell P. Novick, Esquire

Friday, July 11, 12:00-12:50, Room A

Computer Contracts—Upgrades, Support, and Service

Contracts under which computer systems are obtained should address the issues of upgrades, support, and service. Mr. Novick will discuss these issues and consider: the required life of the system, the system's capabilities for upgrade and expansion, modular expansion of the system (both hardware and software) during its lifetime, and continued availability of service and organizations to provide this function. Other important issues include: ownership of software, in-house improvements to both hardware and software, and upgrade policies in leasing arrangements.

Daniel De Salvo
Senior Systems Analyst and Senior Project Manager of Artificial Intelligence and Expert Systems
American Management Systems, Inc.

Friday, July 11, 12:00-12:50, Room D

PCs and Expert Systems: Costs/Benefits

Mr. De Salvo will discuss a technology which is rapidly gaining strength in the market. Many corporate decision makers will, in 1986, be asked to underwrite expert systems projects for thousands of dollars. These requests will be filled with many false ideas about expert systems; some will mistakenly assume that PCs can support the same kind of systems as mainframes and dedicated artificial intelligence workstations. Mr. De Salvo will explain just what expert systems are and describe and compare PC-based expert systems with those that could have been built using more conventional programming techniques. Mr. De Salvo will debunk the myths and set forth the realities about expert systems on PCs and whether they deserve the buyer's investment.

John Petrucci
President
Stanhope Associates Inc.:

Friday, July 11, 12:00-12:50, Room E

Handling Dissimilar Data Using a Chart of Accounts

How would you begin to model your organization within the bigger industry view? This requires the merging of internal, external and economic data having both financial and physical (quantity) natures and varying formats. One example: merging Compustat and ADAPSO data with your internal accounting data. The tools used will be comprised of both database and spreadsheet building blocks on a PC; therefore results will be displayed in normal financial formats, such as income statements, balance sheets and flow of funds.

Moderator:
Nancy Weingarten
Publisher
Information Center Magazine

Friday, July 11, 1:00-2:20, Room A

What Makes an Information Center Tick?

The information center concept has evolved to meet changes and to cope with the frustrations of managing explosive growth of end-user computing. What are the primary roles of and IC? How is it staffed and organized? What should the relationship between the IC and MIS be? How does the IC move from a support unit to a strategic business function? A panel of IC managers and experts will describe how information centers develop, overcome obstacles, and flourish.

panel members

R. Bruce Johnson, Manager
PC Resource Center
Deloitte Haskins & Sells

Peter Crowell
MIS Marketing Director
Digital Equipment Corp.

Mark A. Hagen
Information Center Supervisor
GTE Government Systems Corp.

Terry Steinberg
President
PC Executive Training Center

Moderator:
Harold Joseph Highland
Editor-in-Chief
Computers & Security

Friday, July 11, 1:00-2:20, Room C.

Computer Security: Is Your System Safe and Sound?

A panel of volume buyers, vendors and computer security specialists will discuss mainframe, minicomputer and microcomputer security. Emphasis will be on the security of microcomputer systems , and key areas to be addressed include: system, disk and file access control; data and program protection methods; physical security, especially for portables; micro-mainframe interface and communications; and audit trails of microcomputer operations.

panel members

Belden Menkus
Executive Editor
Journal of Systems Management

Alex Kask
Senior Manager, Computer Audit
Ernst & Whinney;
President
Microcomputer Managers Association

Greg Hagopian
Marketing Manager
On-Line Software

Jeffrey M. Tolk
President and Chief Executive Officer
Software Synergy, Inc.

Moderator:
Bill Laberis
Editor
Micro Marketworld

Friday, July 11, 1:00-2:20, Room D

LANs: Assessing User Needs

Whether or not 1986 proves to be the year of the LAN, users are scurrying to see if the technology available now can provide solutions to their increasingly demanding information requirements. The first and most important step in doing so is in assessing what, if any, LAN needs a user site has. Users must then assess what the most appropriate networking solution might be, and do so with a careful eye to future needs as well as present demands. This panel will focus on these pressing issues, and do so from the perspective of users, LAN installers, and, of course, the vendors.

panel members

Roger Bender
Assistant Vice President
Citibank;
Vice President
Microcomputer Managers Association

Jack Grushcow
President
Consumers Software

John Heather
Director of Systems Engineering IOS
Northern Telecom

Henry Seelbinder
Vice President
Network and Communications
Morris Decision Systems, Inc.

Moderator:
George Kotelly
Editor
Mini-Micro Systems

Friday, July 11, 1:00-2:20, Room E

Micro-to-Minicomputer Communications: An Overview

Sophisticated personal computer applications have created an increasing need for PC users to access and share minicomputer-based data. Microcomputer-to-minicomputer links satisfy this need by allowing the PC's capabilities to be enhanced by the minicomputer's databases and processing power. This presentation will analyze the micro-to-mini connection and explore the varied methods for evaluating, configuring, integrating and applying this connection. It will also examine the present and future technology, as well as market and product trends.

panel members

Safi Qureshey
President
AST Research

Charles Morel
Chief Executive Officer
CXI, Inc.

Robert Zack
Vice President of Corporate Planning
Digital Communications, Inc. Associates

Moderator:
Beth Freedman
Senior Writer
PC Week

Friday, July 11, 2:30-4:00, Room A

Beyond Keyboard Entry: Options in Data Input

This session will cover the emerging technologies for inputing information into PCs as users move away from strict keyboard data entry. Discussions will focus on digital and image scanners, digital tablets, and optical character recognition devices. The session will address how these and other devices have changed data input applications, and consider, as well, what the future portends in this area.

panel members

Linda Worland-Tilander
Wedge Reader Product Manager
INTERMEC Corp.

James R. Moser
Senior Computer Scientist
Kurzweil Applied Intelligence, Inc.

Ray Delisle
Marketing Manager
Kurzweil Computer Products

Val Matula
Manager, Technical Assessment and Support
Tecmar Inc.

Moderator:
J.S. Cooper
Managing Editor
CAD/CIM ALERT

Friday, July 11, 2:30-4:00, Room C

CAD/CAM, Candidly

Leading suppliers of PC based CAD/CAM systems will discuss the latest developments in this best-selling technology, and a corporate CAD/CAM user will offer a personal assessment of its pros and cons. Find out how 3-D modeling can be done on a PC and why you may not require the power of a mainframe for certain applications. Integration of CAD/CAM technology with other systems and applications will also be addressed.

panel members

Doug Campbell
Technical Manager
Autodesk, Inc.

Gregory L. Bloom
Vice President, Products and Marketing
MEGA CADD, Inc.

Rick McElhinney
President
Micro Concepts Inc.

Moderator:
Rich Thoma
President
People & Technology, Inc.

Friday, July 11, 2:30-4:00, Room D

Memory Storage: Past Dreams/Future Visions

Two years ago, 64K of RAM seemed like a lot. Today, 1MB on a RAM chip and a gigabyte of storage are becoming almost commonplace for personal computer users. Disk speeds range from 20 milliseconds to 120 milliseconds, but it is not clear what the difference in speed actually indicates. Should a corporate user always look for the speediest storage medium, or are there other factors that should be considered? Disk caching and ram disks will also be discussed. Other areas to be covered include optical/digital recording technologies.

panel members

Benjamin J. Baughman
Vice President of Marketing
Konan Corporation

Stephen Berkley
President
Plus Development Corp.

Michael Goldberg
President
Software Integration, Inc.

Steven B. Volk
Executive Vice President of Sales and Marketing
Tallgrass Technologies Corp.

David Tovey
Marketing Manager
Toshiba America, Inc.

Moderator:
David Bunnell
Publisher
PC World and Macworld

Lock-Note

Friday, July 11, 2:30-4:00, Room E

The Revolution in PC Publishing

The use of personal computers and laser printers to generate publication quality text and graphics in an office environment has opened up a huge new category of PC applications. A panel will discuss the implication this has for corporations publishing documents, presentations, books, and other information.

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ADACOM CORPORATION
AIRMOLD
ALLOY COMPUTER PRODUCTS
ALTOS COMPUTER SYSTEMS, INC.
AMERICAN PROGRAMMER'S GUILD
ANCHOR PAD INTERNATIONAL, INC.
ANEX TECHNOLOGY, INC.
APPLIED TECHNOLOGY ASSOCIATES, INC.
AUTODESK INC.
AVECO COMPUTER SERVICE
BASF SYSTEMS CORP.
BANYAN SYSTEMS INC.
BEAMAN PORTER, INC.
BELL & HOWELL/QUINTAR DIVISION
BLACK BOX CORP.
BREAKTHROUGH SOFTWARE CORP.
BROTHER INTERNATIONAL CORP.
BYTEL CORPORATION
CANON
CDEX CORP.
CDI SYSTEMS, INC.
CIE TERMINALS
CMP PUBLICATIONS
CPT CORPORATION
CXI, INC.
C.W. COMMUNICATIONS, INC.
CAHNERS PUBLISHING
CENTER FOR ADVANCED DATA PROCESSING
CHASE TECHNOLOGIES INC.
CHUBB INSTITUTE FOR COMPUTER TECHNOLOGY
CITIBANK/DIRECT ACCESS
CITIZEN AMERICA CORPORATION
COMMUNICATIONS RESEARCH GROUP, INC.
COMPUCOVERS
COMPUTER ASSOCIATES
THE COMPUTER CLASSROOM
THE COMPUTER CONSULTING CENTER
COMPUTER APPLICATIONS LEARNING CENTER
COMPUTER EXPERT
COMPUTER LIVING
COMPUTER MAINTENANCE CORP.
COMPUTER PERIPHERALS, INC.
COMPUTER RETAIL NEWS
COMPUTERPREP, INC.
COMPUTER SYSTEMS NEWS
COMPUTERWORLD
CONOGRAPHIC CORP.
CONSUMER EDUCATION TRAINING
CONTROL DATA
CORDATA
CORE TECHNOLOGIES INC.
CORVUS
CULLINET SOFTWARE INC.
DATA ACCESS CORP.
DATA CLEAN
DAYNA
DECISION RESOURCES, INC.
DELTA TECHNOLOGY INTERNATIONAL
DICONIX
DIDAK
DIGITAL COMMUNICATIONS ASSOCIATES
DIGITAL PRODUCTS
DIRECT•AID, INC.
DIVERSIFIED INFORMATION SERVICES, INC.
DRIVE PHONE
DUNCAN-ATWELL COMPUTERIZED TECHNOLOGIES
DYNAX, INC.
EXEC•U•STAT, INC.
EAGLE COMPUTER
EASTMAN KODAK COMPANY
EDUTRENDS, INC.
EMERY WORLDWIDE
ENERTRONICS RESEARCH, INC.
EPSON
EVEREX SYSTEMS, INC.
EXTENDED APPLICATIONS INC.
EXTENDED SYSTEMS INC.
FIFTH GENERATION SYSTEMS
FISCHER INNIS SYSTEMS CORP.
FOGLE COMPUTING CORP.
FORTE COMMUNICATIONS
FOUNTAIN TECHNOLOGIES INC.
FOX RESEARCH INC.
GENERAL PARAMETRICS CORP.
GENERAL POWER SYSTEMS
GENERAL TECHNOLOGY, INC.
GENOA SYSTEMS CORPORATION
GOULD INC.
GRAPHIC COMMUNICATIONS
GRID SYSTEMS CORP.
GULFSTREAM MICRO SYSTEMS
HAUPPAUGE COMPUTER WORKS, INC.
HANDIC SOFTWARE
HAYES MICROCOMPUTER PRODUCTS
HITACHI SALES CORP. OF AMERICA
IBM CORP.
IMSL INC.
IRWIN MAGNETICS, INC.
IVY COMPUTER SYSTEMS
ITT INFORMATION SYSTEMS
INFORMATION WEEK
INFORMATION BUILDERS
INNOVATIVE TECHNOLOGIES
INTEGRATED NETWORK SYSTEM
INTEL CORPORATION
IOMEGA CORP.
JACOBS COMPUTER SERVICES
JUKI OFFICE MACHINE CORP.
KAMMERMAN LABS
KLS INC.
KEY TRONIC
KIMTRON CORPORATION
KRAFT SYSTEMS
KURZWEIL AI
KURZWEIL COMPUTER PRODUCTS, INC.
LEADING EDGE PRODUCTS, INC.
LEXISOFT INC.
LIFETREE SOFTWARE
LOTUS DEVELOPMENT CORP.
MARC SOFTWARE INTERNATIONAL
MANNESMANN TALLY
MANSFIELD SOFTWARE GROUP
MARTIN MARIETTA DATA SYSTEMS/ITSOFTWARE
MATRIX INSTRUMENTS
Mc CORMACK & DODGE
MEMOREX, MEDIA PRODUCTS GROUP
MICROCOMPUTER MANAGERS ASSOCIATION
MICRO DATA BASE SYSTEMS, INC.
MECA/MICRO EDUCATION CORP. OF AMERICA
MICRO RENTALS
MICROCONCEPTS INC.
MICROPRO INTERNATIONAL INC.
MICROVIDEO LEARNING SYSTEMS
MICRORIM, INC.
MICROSOFT CORP.
MICROSTUF, INC.
MICROVITEC, INC.
MINDSOFT
MINI-MICRO SYSTEMS
MINITAB, INC.
MITSUBISHI ELECTRONICS AMERICA, INC.
MOUNTAIN COMPUTER
NEC INFORMATION SYSTEMS
N/HANCE SYSTEMS
NYPC
NATIONAL MEMORY SYSTEMS CORP.
NESTAR SYSTEMS, INC.
NETWORK DEVELOPMENT CORP.
NORTH EDGE SOFTWARE CORP.
NOVELL, INC.
OFFICIAL AIRLINE GUIDES
OTC-OUTPUT TECHNOLOGY CORP.
OMNIOFFICES
OASYS/OFFICE AUTOMATION SYSTEMS, INC.
OFFICE SOLUTIONS
OPTICAL COATING LAB, INC.
OUTPUT TECHNOLOGY CORP.
PC EXCHANGE
PC EXECUTIVE TRAINING CENTER
PC MAGAZINE
PC PRODUCTS
PC WEEK
PC WORLD
PARA SYSTEMS, INC.
PARAMETER DRIVEN SOFTWARE
PEOPLE & TECHNOLOGY
PERCOM DATA CORP.
PHILIPS INFORMATION SYSTEMS, INC.
PIVAR COMPUTING SERVICES
POLAROID
PRIAM
PRIMAGES INC.
PRIMAVERA SYSTEMS
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SORBUS, A BELL ATLANTIC CO.
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SPECTRUM HOLOBYTE
STANHOPE ASSOCIATES INC.
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STRATEGIC SOFTWARE PLANNING CORP.
SYSGEN INCORPORATED
TAVA U.S.A. INC.
TACTICAL COMPUTER CONSULTANTS, INC.
TALLGRASS TECHNOLOGIES CORP.
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TATUNG COMPANY
TEAMMATE DIV. DATA TECHNOLOGY
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TECMAR
TELEVIDEO SYSTEMS, INC.
TELEBYTE TECHNOLOGY, INC.
THE SOFTWARE GROUP
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TORI CORPORATION
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PC EXPO has arranged special airfare discounts for attendees traveling roundtrip to the Show. Fly to PC EXPO and receive the following special discounts:

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NAMES OF OCCUPANTS	ROOM TYPE	ARRIVE	DEPART

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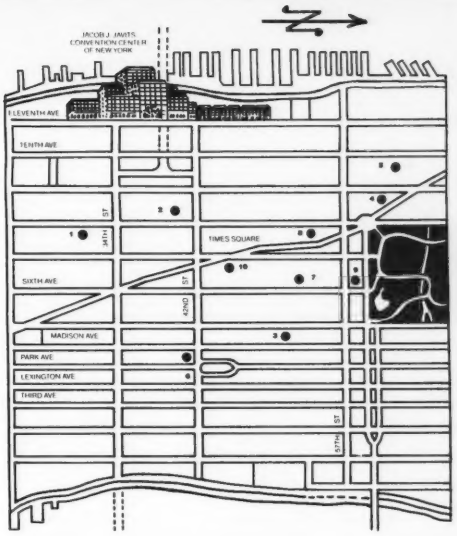

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PC EXPO attendees must be qualified. Please check one box only in each of Fields I and III or Fields II and III. (Minors may not register.)

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4 ☐ Office products dealer
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6 ☐ Software developer
7 ☐ Systems house
8 ☐ Turnkey vendor
9 ☐ Value adder
10 ☐ Other (specify)_____

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C ☐ Banking
D ☐ Communications
E ☐ Construction/Architects
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G ☐ Education
H ☐ Engineering
I ☐ Government/Military
J ☐ Hospital
K ☐ Hotel
L ☐ Industrial design
M ☐ Insurance
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U ☐ Securities broker
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Y ☐ Other specify _____

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HH ☐ Engineer (all)
II ☐ MIS Dir./Mgr.
JJ ☐ Programmer
KK ☐ Purchasing
LL ☐ Sales/marketing
MM ☐ Scientist
NN ☐ Securities financial analyst
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MAIL ORDERS must be received by PC EXPO no later than June 19, in which case your show badge will be mailed to you on or before June 25. Mail orders received after June 19 will be processed and the badge held for arrival under the individual's name at the "Will Call" desk in the show lobby. Registration fees must be in U.S. funds. All foreign mail orders, except Canada, must be received by June 9, and such badges will not be sent by return mail, but held at the "Will Call" window for pick-up on arrival. All registrations are non-refundable.

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1 2 3 4 5 6

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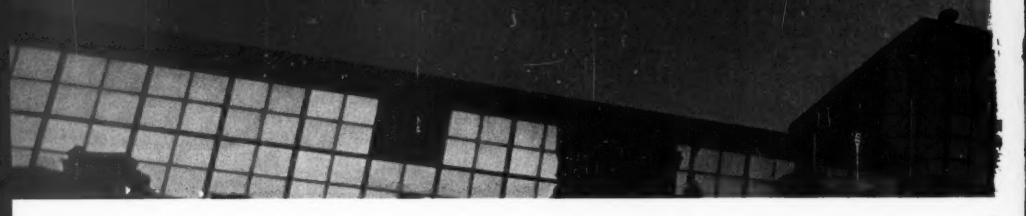

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1 2 3 4 5 6

Product Spotlight/Disaster Recovery Planning

Continued from page 64

Initiation Fee: No
Per Diem/Usage Charge: $100/hour — hot site, $1.25/sq ft — cold site

TOTAL SUBSCRIBERS PER CENTER: 130 total at six sites, 100 per site maximum

COMMENTS: Members have access to all sites; will open sites in Georgia, Florida and Illinois in mid-1986 with Univac and IBM CPUs

KENTUCKY

Dataguard Recovery Services, Inc.
P.O. Box 37144
Louisville, Ky. 40232

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Honeywell Tandem DPS 8/70, Honeywell DPS 6, 8,800-sq-ft raised floor, 2,500-sq-ft dedicated office space, 400 data lines, 48 2,400 to 9.6K bit/sec. modems
Data and Telecommunications: Tymnet/McDonnell Douglas Network Systems' Public Data Network, AT&T T1 Accunet Reserve, AT&T Switched 56K bit/sec. Accunet
Site Security: 24-hour guard on duty, all doors alarmed to security service, all doors access-secured, closed-circuit TV
Test Time: 48 hours at no additional cost, additional time available

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes, contingency plans and risk analysis
Technical Support: System programming and communications
Data Storage: System software only
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,600 to $8,000, depending upon configuration
Term of Contract: One to five years
Initiation Fee: $10,000 to $15,000
Per Diem/Usage Charge: $1,000 to $6,000

TOTAL SUBSCRIBERS PER CENTER: 100

COMMENTS: Not available

MASSACHUSETTS (Burlington)

Digital Equipment Corp.
146 Main St.
Maynard, Mass. 01754

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: DEC VAX-11/780, PDP-11
Data and Telecommunications: Tymnet, communications links
Site Security: Electronic access system
Test Time: 32 hour/year, minimum two test/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes, separately priced
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $2,500/mo
Term of Contract: Not available
Initiation Fee: $3,000
Per Diem/Usage Charge: $1,000 to $2,500/day, limit 30 days

TOTAL SUBSCRIBERS PER CENTER: Not available

COMMENTS: Special recovery insurance available

MASSACHUSETTS (Lexington)

Phoenix Services, Inc.
1762 Massachusetts Ave.
Lexington, Mass. 02173

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: Prime 750
Data and Telecommunications: Dial-up lines, two packet data networks
Site Security: Electronic codes, locked doors to computer
Test Time: Two test/year, each 12 hours; additional available

ADDITIONAL SERVICES AVAILABLE:
Consulting: No
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $500 to $1,500/mo
Term of Contract: One year
Initiation Fee: No
Per Diem/Usage Charge: $1,500/day or per system usage

TOTAL SUBSCRIBERS PER CENTER: 14 current, 35 maximum

COMMENTS: Not available

MICHIGAN

Corporate Contingency Services
P.O. Box 805
New Hudson, Mich. 48165

TYPE OF SERVICE: Both hot and cold sites, also offers special replacement services

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4341, 3083; shell is 2,000 to 4,500 sq ft; 3,200-sq-ft office space guaranteed
Data and Telecommunications: 200 pair live cable, 30 dial backup units, 24 dial-up lines
Site Security: Yes
Test Time: 48 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes, subscribers only
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,600 to $5,000/mo
Term of Contract: One, two and three years
Initiation Fee: $15,000 to $20,000
Per Diem/Usage Charge: $3,000 to $6,000/day — hot site

TOTAL SUBSCRIBERS PER CENTER: 45 current, 80 maximum

COMMENTS: Includes all IBM disk, tape and telecom technologies; IBM 3081 Model K available third-quarter 1986

MINNESOTA

Eloigne Corp.
P.O. Box 4707
St. Paul, Minn. 55104

Continued on page 82

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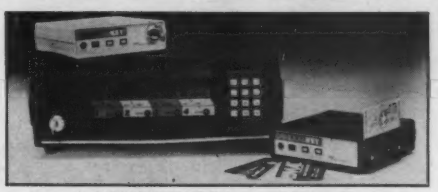

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MicroFrame Inc.
2551 Route 130, Cranbury, NJ 08512
(609) 395-7800

Continued from page 81

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3081
Data and Telecommunications: Four-wire leased center
Site Security: Electronic access cards, guards when site is in use
Test Time: 96 hour/year — hot site

ADDITIONAL SERVICES AVAILABLE:
Consulting: No
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,600 to $5,900/mo — hot, $500 to $1,300/mo — cold
Term of Contract: One-, three- and five-year — hot; one-, three-, five- and seven-year — cold
Initiation Fee: $5,000 to $15,000
Per Diem/Usage Charge: $1,500 to $5,000/day — hot, utilities only — cold

TOTAL SUBSCRIBERS PER CENTER: 60 current for both, 80 maximum for both

COMMENTS: Not available

MISSOURI

Midwest Hotsite, Inc.
1605 Manufacturers Drive
St. Louis, Mo. 63026

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Two IBM 370s, IBM 3033 Attached Processor, IBM 4341
Data and Telecommunications: Paradyne PIX and IBM 3705 communications controller, 200 pair communications lines
Site Security: Card key access, radar and motion detectors
Test Time: Four test/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY: **Subscription Rates:** $900 to $2,150/mo — hot site, $300/mo — cold site
Term of Contract: One, two and three years
Initiation Fee: $5,000
Per Diem/Usage Charge: $1,500/day — hot site; $200/day — cold site

TOTAL SUBSCRIBERS PER CENTER: 10 current; 55 maximum

COMMENTS: Not available

MONTANA

Comcare, Inc.
P.O. Box 2547
Billings, Mont. 59103

TYPE OF SERVICE: Hot site (shared)

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM System/38 Model 8 with one-billion-character on-line storage
Data and Telecommunications: IBM 5251 Model 12 CRT, 4.8K bit/sec. modem, two telephone lines, more available on request
Site Security: Combination lock and password security
Test Time: 36 hour/year, required; additional $125/hour

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No, minimum storage only
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $800/mo
Term of Contract: Three-year minimum
Initiation Fee: $3,500
Per Diem/Usage Charge: $2,500/day

TOTAL SUBSCRIBERS PER CENTER: 10 current, 50 maximum

COMMENTS: Special System/38 disaster recovery manual, run applications by telephone link or on-site

NEW JERSEY (Carlstadt)

Comdisco Disaster Recovery Services, Inc.
6400 Shafer Court
Rosemont, Ill. 60018

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3084, 3081, 3083 and 4341; standby check processing systems; 15,000-sq-ft office and storage space
Data and Telecommunications: Comline 2 and 3 network, 300 to 9.6K bit/sec. modems
Site Security: 24-hour security service
Test Time: 32 to 48 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,450 to $13,000/mo — hot site
Term of Contract: One to five years
Initiation Fee: $10,000 to $50,000 — hot
Per Diem/Usage Charge: $2,500 to $20,000/day — hot site

TOTAL SUBSCRIBERS PER CENTER: 200 current total, 100 maximum per hot site

COMMENTS: Contact vendor for cold-site pricing

NEW JERSEY (Elmwood Park)

Host Consulting Services, Inc.
555 Gaffie Road
Ridgewood, N.J. 07450

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4341
Data and Telecommunications: IBM 3705 communications controller, 100 phone lines
Site Security: 24-hour force, guards, card access
Test Time: 40 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,800 to $3,500/mo
Term of Contract: Three to five years
Initiation Fee: No
Per Diem/Usage Charge: $2,500/day, no usage limit

TOTAL SUBSCRIBERS PER CENTER: 20 current, 40 maximum
COMMENTS: Will be opening a hot site in southern New Jersey in mid-1986

Continued on page 86

Here's how to join the new leaders in Supercomputer technology:

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Which is exactly what we've done.

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Our first concern was to make IRMA's file transfer capability faster. That's why we developed IRMAlink FT/TSO & FT/CMS.™

Bundled together and free with the purchase of an IRMA board, it's flexible enough for the inexperienced user to initiate file transfers easily and the more experienced to customize transfers to the mainframe environment.

IRMA. It made PC-to-mainframe communications possible.

If your PC uses PROFS/PCC, PS/PC or 3270 file transfer you can now use IRMAlink FT/3270™ to send and receive mail and document files.

Some of our customers wanted software that would enable them to view their PC and terminal screens simultaneously.

We gave them IRMAlink Windows.™ It increases user productivity dramatically by managing PC, mainframe and notepad applications on the same screen.

Many of our customers who already were accustomed to the keyboard of the 3278 felt awkward with the PC keyboard. And vice versa. We responded with the IRMAkey/3270.™ It's a keyboard that places all the 3278 and PC functions together. No matter whether users learned on an IBM PC or 3278, they'll feel comfortable and be more productive with the IRMAkey/3270.

IRMAlink. Software that extends IRMA's power.

With all these enhancements, IRMA was truly becoming a more powerful business tool.

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IRMAcom is a board that gives your remote PC users economical, high-speed access to the front-end processor. Instead of having to buy a controller to handle one or several remote locations, you can now use IRMAcom and a synchronous modem

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IRMAcom. A board that makes remote PCs communicate with the mainframe without the need for a controller.

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IRMAprint. It allows just about any printer you want work in the 3270 environment.

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Continued from page 82

NEW JERSEY (Princeton)

Mobile Computer Recovery
211 College Road E.
Princeton, N.J. 08540

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3070, 4300 series; NCR 8575 II, supports NCR V series, 8500 and 8600 CPUs; shell available for any computer type
Data and Telecommunications: Permanent hot site only — 22 ports, up to 64 available; NCR Model 621 multiplexer
Site Security: Wells Fargo Computer Security
Test Time: Two test/year, eight hours each, additional $150/hour

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $400 to $1,800/mo — hot; $300/mo — shell
Term of Contract: One, three or five years
Initiation Fee: Equal to three-month subscription
Per Diem/Usage Charge: $1,500/day — hot site; $500/day — shell

TOTAL SUBSCRIBERS PER CENTER: Eight current — hot, 35 maximum

COMMENTS: Mobile hot sites, cold sites and office sites also available

NEW YORK

Host Consulting Services, Inc.
585 Gaffie Road
Ridgewood, N.J. 07450

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4381, shell space is limited
Data and Telecommunications: IBM 3725 communications controller, 100 phone lines
Site Security: 24-hour force, guards, card access
Test Time: 40 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes, limited
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,800 to $3,500/mo
Term of Contract: Three to five years
Initiation Fee: No
Per Diem/Usage Charge: $2,500/day, no usage limit

TOTAL SUBSCRIBERS PER CENTER: 20 current, 40 maximum

COMMENTS: Will be opening a hot site in southern New Jersey in mid-1986

NORTH CAROLINA

Compusource
1155 Kildaire Farm Road
Cary, N.C. 27511

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM-compatible mainframe running DOS/VSE, MVS, VM plus other operating systems; one idle CPU for recovery uses
Data and Telecommunications: 300-1,200 bit/sec. asynchronous dial-up, 2,400-14.4K bit/sec. synchronous dedicated and dial-up lines
Site Security: Outside key access, card and code entry to computer
Test Time: Three test/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: No
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,000 to $8,000/mo
Term of Contract: Three to five years
Initiation Fee: $10,000
Per Diem/Usage Charge: $1,500/day

TOTAL SUBSCRIBERS PER CENTER: Five current, 50 maximum

COMMENTS: Vendor also has two production CPUs with IBM RACF security software

OHIO (Dayton)

NCR Corp.
1700 S. Patterson Blvd.
Dayton, Ohio 45479

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: NCR 8635, 8564 Group 2, capable of running NCR 1950s, 1920s and 8535 to 8596s; office space available
Data and Telecommunications: 100 lines with monitoring, modems available; AT&T Accunet Reserve Service
Site Security: Electronic and guards, codes and pass to computer
Test Time: Two test/year, usually 48 hours per subscriber

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes, up to 50 tape reels
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,000 to $7,000/mo, plus additional fees
Term of Contract: One or two years
Initiation Fee: See below
Per Diem/Usage Charge: $20,000 to $50,000 for the first 10 days; see below

TOTAL SUBSCRIBERS PER CENTER: 35 maximum per center

COMMENTS: $750 to $2,500/day for the 11th to the 90th day, 10% additional for unlimited use

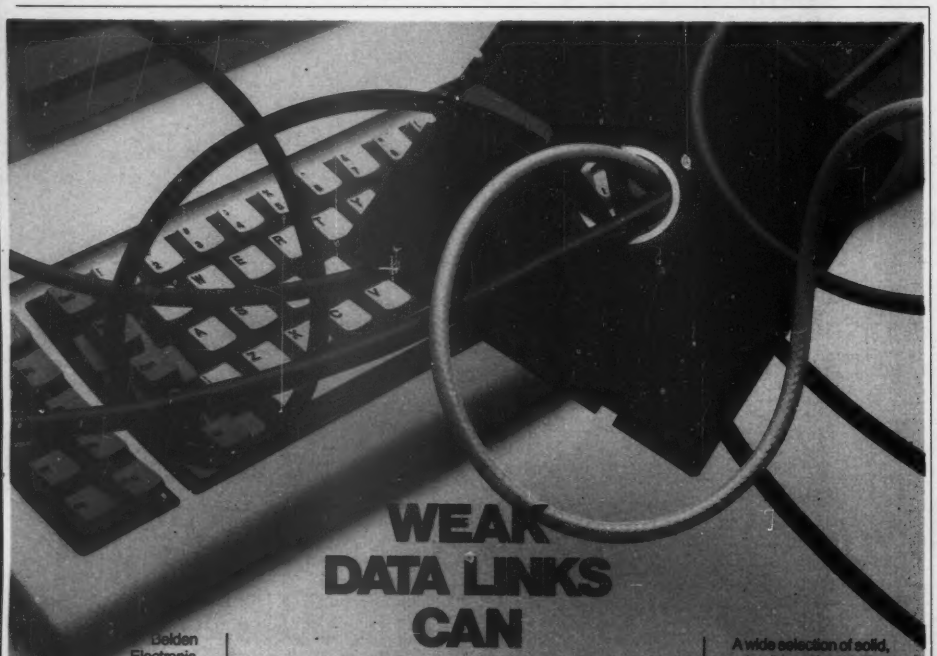
OHIO (Niles)

Hotsite
1000 Warren Ave.
Niles, Ohio 44446

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4341-M02, DASD available, will be upgraded to IBM 4381-P02 in mid-1986
Data and Telecommunications: Full network backup available
Site Security: Badge reader, closed-circuit TV, 24-hour guard service
Test Time: 32 to 60 hour/year, $100 each additional hour

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes, no charge



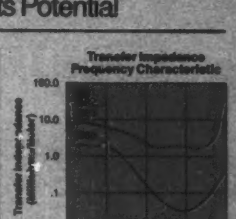
WEAK DATA LINKS CAN STRANGLE YOUR LAN

Belden Makes Your System Achieve Its Potential

Belden Electronic Wire and Cable combines the innovation and experience necessary to keep your LAN running efficiently —without interference and limitations that can tie data into knots.

Your local area network requires cable links of dependable quality to ensure rapid and complete processing of information. Electrical characteristics like capacitance, bit-rate and transfer impedance must be evaluated carefully and matched to system data speed, electrical requirements and environmental conditions. Belden produces a wide range of cables suited for use in LANs, including: multi-conductor, paired, coaxial, fiber optic, and plenum products. Belden has also developed a selection of cables specifically designed for LAN applications. Ethernet*, Omninet**, AppleTalk†, IBM qualified cables for the IBM Cabling Systems, and cables manufactured to IEEE 802.3 specifications are available from Belden.

Belden® cable will keep your system operating smoothly with innovative shielding to minimize EMI and RFI interference and superior dielectrics for low signal loss. Beldfoil®, Duofoil®, Duobond II®, and our Z-Fold are a few of the unique shielding designs available.



This graph charts the reliable shielding performance of several Belden® cables for Ethernet LANs.

A wide selection of solid, semi-solid and foamed insulations, such as Datalene® insulation, provide reliable high-speed, low-distortion data handling. The benefits of these constructions and materials have made Belden an industry leader, your convenient source for LAN cables.

What's the value of a network limited by inferior cable links? Your system requires consistent, dependable quality. Belden quality. Backed with technical support, thorough testing and innovative technology. Call Belden's technical service team and untangle the potential of your LAN with Belden quality cable. For assistance and information on LAN requirements, contact Belden Electronic Wire and Cable, P.O. Box 1980, Richmond, IN 47375.

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***Corvus trademark.*
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There is no equal.

BELDEN

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Data Storage: Yes, operating system only
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $895 to $2,645/mo
Term of Contract: One- to five-year
Initiation Fee: $5,000 to $10,000
Per Diem/Usage Charge: $2,500 to $5,000/day, price increases after eight weeks

TOTAL SUBSCRIBERS PER CENTER: 45 current, 100 maximum

COMMENTS: IBM 1419 micro/sorter reader, Paradyne PIX, IBM Series/1, second site planned

OHIO (Solon)

LDI Disaster Recovery Corp.
30700 Carter St.
Solon, Ohio 44139

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4341, 3032, 3033, 3083; 3380, 3350 DASD; laser printer; 4,000-sq-ft office space with terminals
Data and Telecommunications: 500 data pair, 300 voice lines, AT&T T1 Accunet Reserve Network
Site Security: American District Telegraph security
Test Time: 32 hour/year, additional hours available

ADDITIONAL SERVICES AVAILABLE:
Consulting: No
Technical Support: Yes
Data Storage: No
Plan Storage: Yes, plus forms, equipment for recovery needs

PRICING AND AVAILABILITY:
Subscription Rates: $1,500 to $4,300/mo — hot, $800 to $1,100/mo — shell
Term of Contract: One, two and three years
Initiation Fee: $10,000
Per Diem/Usage Charge: $2,500 to $6,000/day — hot, $500/day — shell

TOTAL SUBSCRIBERS PER CENTER: 50 maximum each per CPU and shell

COMMENTS: Limit one subscriber from same building

OKLAHOMA

Data Processing Security, Inc.
200 E. Loop 820
Fort Worth, Texas 76112

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Amdahl V8B (compatible with IBM 3083), 8,000-sq-ft raised floor, 8,000-sq-ft office space
Data and Telecommunications: 300 data pairs
Site Security: Badge controls, alarmed doors, closed-circuit TV, fire protection system
Test Time: 24 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $2,500/mo — hot site, $1,000/mo — cold site
Term of Contract: Three-year — hot site, seven-year — cold site
Initiation Fee: No
Per Diem/Usage Charge: $250/hour — hot site, $1.25/sq ft — cold site

TOTAL SUBSCRIBERS PER CENTER: 130 total at six sites, 100 per site maximum

COMMENTS: Members have access to all sites; will open sites in Georgia, Florida and Illinois in mid-1986 with Univac CPUs and IBM

ONTARIO

Computer Recovery Facility, Inc.
P.O. Box 871
Mississauga, Ont., Canada L5M 2C4

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Amdahl 5880; IBM System/38 Model 40; Sperry 1100/82; IBM compatible for DOS, VS, MVS, XA; 30,000-sq-ft raised floor
Data and Telecommunications: 900 pair Bell Canada and 200 Canadian National/Canadian Pacific lines, additional services available
Site Security: Badge key access, closed-circuit TV, motion detection
Test Time: 60 hour/year, additional time available

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: Unbundled for various hot sites, $3,600 to $21,000/year — cold site
Term of Contract: Seven years
Initiation Fee: No
Per Diem/Usage Charge: Hot — free for three weeks, then $500/hour for four to six weeks, $1,500/hour for seventh week

TOTAL SUBSCRIBERS PER CENTER: 70 current, 160 maximum

COMMENTS: DASD available, six cold-site rooms, 30,000-sq-ft office space, cold site is $1.25/sq-ft/mo on occupancy only

PENNSYLVANIA (Newtown)

Continental Computer Assurance Corp.
125 Pheasant Run
Newtown, Penn. 18940

TYPE OF SERVICE: Both, cold site limited to hot-site subscribers

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 4341, 4361, 4391
Data and Telecommunications: Memorex 1270, Paradyne PIX and IBM 3705 M82 communications controller with 10 lines
Site Security: Yes
Test Time: 16 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,750 to $2,250/mo
Term of Contract: Three, four and five years; custom terms available
Initiation Fee: No

Continued on page 88

"Not now, I've got a headache."

—Computer backup excuse #14

It's not a very good excuse.

But when it comes to doing computer backup, any excuse will do. Because backing up, let's be brutally honest, is somewhat short of the thrill-a-minute category.

Not backing up, on the other hand, can really be exciting. Involving some interesting things like travel to other cities (while you're looking for another job), and the fun of even entering a whole new line of work.

After one big failure on disk the night before a big meeting, the programmer (who didn't back up) was so crushed that he hung up his business suit and joined the ministry. No kidding.

And if that doesn't make you want to back up your data religiously, we don't know what will.

To learn more about backup and other applications of the data cartridge, a 3M developed technology whose time has come, contact your local computer products dealer.

When you run out of excuses.™

Continued from page 87

Per Diem/Usage Charge: $150/hour, no maximum usage

TOTAL SUBSCRIBERS PER CENTER: 33 current, 60 maximum

COMMENTS: Not available

PENNSYLVANIA (Philadelphia)

Sungard Recovery Services, Inc.
1285 Drummers Lane
Wayne, Pa. 19087

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3033, 3081 Model G, 3081 Model KX, and 3083 Model JX; 4,000-sq-ft office space; will add IBM 3090 in mid-1986
Data and Telecommunications: 120 dial-up lines, 1,800/2,100 bit/sec. twisted-pair cable
Site Security: Card key access, closed-circuit TV, 24-hour guard
Test Time: 32 to 48 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $3,100 to $12,000/mo — hot site
Term of Contract: One to five years, four-year average
Initiation Fee: $25,000 — hot
Per Diem/Usage Charge: $4,500 to $8,000/day — hot site

TOTAL SUBSCRIBERS PER CENTER: 360 current Pennsylvania and Illinois total, 440 maximum both sites total

COMMENTS: Will be adding site in California; check service available including magnetic ink character recognition, proof encoding, check transaction, check clearing

PENNSYLVANIA (Warminster)

Disaster Control, Inc.
P.O. Box 2639
Warminster, Pa. 18974

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Burroughs V 380, B7900 Model F
Data and Telecommunications: 150 data lines, modems and test equipment
Site Security: Electronic access controls
Test Time: Two test/year (one day each approximate duration)

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes, limited
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,000 to $6,500/mo, based on subscriber configuration
Term of Contract: One year
Initiation Fee: $10,000
Per Diem/Usage Charge: Contact vendor

TOTAL SUBSCRIBERS PER CENTER: 50 current, 75 maximum

COMMENTS: Not available

TEXAS (Fort Worth)

Data Processing Security, Inc.
200 E. Loop 820
Fort Worth, Texas 76112

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Burroughs B7800, 20,000-sq-ft raised floor, 15,000-sq-ft office space
Data and Telecommunications: 1,200 data pairs
Site Security: Badge controls, alarmed doors, closed-circuit TV, Halon fire protection systems
Test Time: 24 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $2,500/mo — hot site, $1,000/mo — cold site
Term of Contract: Three years — hot, seven years — cold
Initiation Fee: No
Per Diem/Usage Charge: $250/hour — hot site, $1.25/sq ft — cold site

TOTAL SUBSCRIBERS PER CENTER: 130 total at six sites, 100 per site maximum

COMMENTS: Members have access to all sites; will open sites in Georgia, Florida and Illinois in mid-1986 with Univac and IBM CPUs

TEXAS (Grand Prairie)

Comdisco Disaster Recovery Services, Inc.
6400 Shafer Court
Rosemont, Ill. 60018

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3081 and 4341, 8,000-sq-ft office and storage space, standby check processing system available
Data and Telecommunications: Comline 2, 300 to 9.6K bit/sec. modems, 900 wire pairs
Site Security: Badge readers
Test Time: 32 to 48 hour/year, additional available

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,450 to $13,000/mo — hot site
Term of Contract: One to five years
Initiation Fee: $10,000 to $50,000 — hot
Per Diem/Usage Charge: $2,500 to $20,000/day — hot site

TOTAL SUBSCRIBERS PER CENTER: 110 current total, 100 maximum per CPU

COMMENTS: Contact vendor for cold-site pricing

TEXAS (Houston)

Data Processing Security, Inc.
200 E. Loop 820
Fort Worth, Texas 76112

TYPE OF SERVICE: Hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3080 series, 15,000-sq-ft raised floor, 12,000-sq-ft office space
Data and Telecommunications: 300 data pairs
Site Security: Badge controls, alarmed doors, closed-circuit TV, fire protection systems
Test Time: 24 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,500/mo — hot site, $1,000/mo — cold site
Term of Contract: Three years — hot site, seven years — cold site
Initiation Fee: No
Per Diem/Usage Charge: $250/hour — hot site, $1.25/sq ft — cold site

TOTAL SUBSCRIBERS PER CENTER: 130 total at six sites, 100 per site maximum

COMMENTS: Members have access to all sites; will open sites in Georgia, Florida and Illinois in mid-1986 with Univac and IBM CPUs

UTAH

Data Processing Security, Inc.
200 E. Loop 820
Fort Worth, Texas 76112

TYPE OF SERVICE: Both hot and cold sites

SITE CHARACTERISTICS:
Host Computer(s) Supported: Amdahl V6, 4,000-sq-ft raised floor, 4,000-sq-ft office space
Data and Telecommunications: 300 data pairs
Site Security: Badge controls, alarmed doors, closed-circuit TV, fire protection systems
Test Time: 24 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: Yes
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $1,500/mo — hot site, $1,000/mo — cold site
Term of Contract: Three years — hot, seven years — cold
Initiation Fee: No
Per Diem/Usage Charge: $100/hour — hot, $1.25/sq ft — cold

TOTAL SUBSCRIBERS PER CENTER: 130 total at six sites, 100 per site maximum

COMMENTS: Members have access to all sites; will open sites in Georgia, Florida and Illinois in mid-1986 with Univac and IBM CPUs

WASHINGTON

Weyerhauser Recovery Services
CCB-3C
Tacoma, Wash. 98477

TYPE OF SERVICE: Hot site

SITE CHARACTERISTICS:
Host Computer(s) Supported: IBM 3083 and 4341, DEC VAX-11/780, Honeywell DPS 8, Hewlett-Packard HP 3000 Series 58
Data and Telecommunications: 200 voice and data lines, 300 to 56K bit/sec. modems, T1 service
Site Security: Restricted access, card key and passwords
Test Time: 48 hour/year

ADDITIONAL SERVICES AVAILABLE:
Consulting: Yes
Technical Support: Yes
Data Storage: No
Plan Storage: Yes

PRICING AND AVAILABILITY:
Subscription Rates: $2,500 to $6,000/mo
Term of Contract: One or three years
Initiation Fee: None, minimum usage four days
Per Diem/Usage Charge: $2,000 to $6,000/day, maximum eight weeks

TOTAL SUBSCRIBERS PER CENTER: Six current/CPU; 48 maximum/CPU

COMMENTS: Laser printers, IBM 3800 Model 3 available

This chart was adapted from a February 1986 report, "Datapro Reports on Information Security," published by Datapro Research Corp., a Delran, N.J.-based market research firm. Further information is available from the site providers.

SURVIVAL OF THE FITTEST.

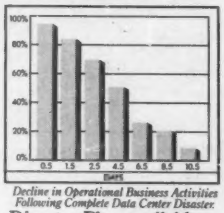
A Survival Plan That Fits

Finding a disaster recovery plan to fit your computer requirements can be a disaster in itself. But now, with CompuSource, a protection plan can be tailored to fit your needs.

Our Disaster Recovery Plan provides the services and protection vital to your company's survival.

With Hotsite and Relocatable Coldsite facilities, and Disaster Plan Consulting, we offer the most complete Disaster Plan available.

Large or small, we have a plan to fit your size.



Decline in Operational Business Activities Following Complete Data Center Disaster

COMPUSOURCE

For more information call (919) 469-3325 or write to CompuSource c/o Marketing Department, 110 MacKenan Drive, Cary, N.C. 27511.

In Depth

Managing from the bottom up

Tips on becoming a more effective subordinate

CW PHOTO BY P. CHARLES LADOUCEUR

Managing the boss does not mean manipulating, subverting or out-politicking your supervisor. Employees can improve the quality of their work lives by exploring how their styles and their bosses' styles mesh.

By GIL GORDON

Do any of these scenarios sound familiar to you?

• Alex, a systems analyst, can't figure out why his boss grimaces and frowns when told about all the support Alex has been providing to a product manager in one of the company's smaller marketing divisions. Alex has made more headway than anyone else with this product manager, but the boss still seems to be upset about it.

• Lee, a programming manager, squirms in her seat as she sits through yet another meeting during which her boss struggles through his attempt at making a presentation. Talking in front of a group is easy for Lee — if only her boss didn't have such a hard time.

• Steve, a computer operations manager, is action oriented and likes to make decisions fast. His boss drives him crazy — she always has to think things through down to the smallest detail. She's always after Steve to plan things out and consider all the options, but he would rather act on his instincts.

What factor do these three situations have in common? These people are not managing upward effectively. In other words, they are not managing their bosses as well as they could. Managing the boss should not be a taboo subject. Just think about it — we teach people to manage down to their subordinates, and more and more organizations are teaching people to manage across in dealings with users or peers. The next logical step is to teach people to manage upward.

As technology advances and end-user computing grows, most DP personnel find that the old rules about what has to be done to please the boss have changed. Bosses at all levels face new pressures regarding the role of data processing, pressures that translate to new pressures on the boss-subordinate relationship.

People who manage their bosses enjoy two benefits. First, they make life easier for themselves and their bosses. Second, they make themselves more valuable to the organization and to the boss because they are more effective and versatile in their role as subordinates. In the long run, this reflects well on the subordinate as well as on the manager.

The phrase "managing your boss" can conjure up a host of negative images. Far from being Machiavellian in nature, though, managing the boss simply means looking beyond the scope of your own job, carefully assessing how you and the boss get along and working on making yourself more valuable.

Above all, managing the boss does not mean manipulating, subverting or out-politicking the boss. Few people who rely heavily on those tactics are successful over time.

"I've seen people overmanage the boss, and they forget he's the boss," notes Allan Deering, director of management information services at Pepsico, Inc. "They try to manage around the boss; this might work in the short run but fails in the long run."

Some practical strategies are available to help you understand some of

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Gordon is president of Gil Gordon Associates, a human resource consulting firm in Monmouth Junction, N.J. He edits the newsletter "Telecommuting Review" and consults on telecommuting implementation.

the critical aspects of the boss-subordinate relationship, assess and improve the way you are managing your boss and build on the strengths already in the relationship.

Help the boss

Why is it important to manage upward? Why should you be concerned about being a more effective subordinate?

If you can create a mutually satisifying relationship, it's bound to help your career. Your boss can be your biggest supporter — if the two of you work well together. In addition, you both won't be wasting time and energy resolving problems between the two of you; that energy and time instead will be spent on getting the job done.

> ***Managing the boss means looking beyond the scope of your own job, assessing how you and the boss get along and working on making yourself more valuable.***

Being a manager is not an easy job, and many bosses need help being a boss. They may not readily admit this fact, but it is to their advantage — and ultimately to yours — when you help the boss be more effective.

In addition, if you and your boss don't maintain a good working relationship with at least a moderate amount of trust and cooperation, you — not the boss — will suffer.

Don't make the mistake that some people do by putting too much emphasis on managing their bosses and not enough on managing their own jobs. Your boss is most interested in the quality and consistency of your performance.

If you are not doing the job you're expected to do, managing the boss better probably will not help one bit.

Gaining insight

Some of the technologies often used by DP people can help deal with the pressures of the boss-subordinate relationship. Harold Farin, vice-president of information systems at The Prudential in Roseland, N.J., points to the benefits of electronic mail.

"We send a lot of notes to each other via E-mail instead of taking the time to write and send a formal memo. It's a good way to keep the boss posted, and the boss, in turn, can respond quickly when need be," Farin notes.

Two short exercises can help you gain some insight into how well you work with your bosses. First, make a list of all the bosses you've had for at least the past five years.

Divide the names on this first list into three sub-lists: the people with whom you had no problems, those with whom you had some problems and the ones that caused many problems. Then look for patterns or common factors that might help explain the groupings.

Don't look only at the boss' characteristics; look also at your own performance, the type of work and other variables. If you find, for example, that you have never worked well with a boss who is very unstructured and supplies you with only the most general direction, this should tell you that you have to manage that kind of situation by working with the boss to define your job goals and expectations better.

Second, take a few minutes to complete the following sentences. (These are adapted from an excellent book, *How to Manage Your Boss*, by Christopher Hegarty, Ballantine Books, 1985.) The answers will help you focus more on what fuels the relationship between you and your boss.

— My boss and I get along best when . . .

— If I were in my boss' position I would . . .

— My boss could get more out of me by . . .

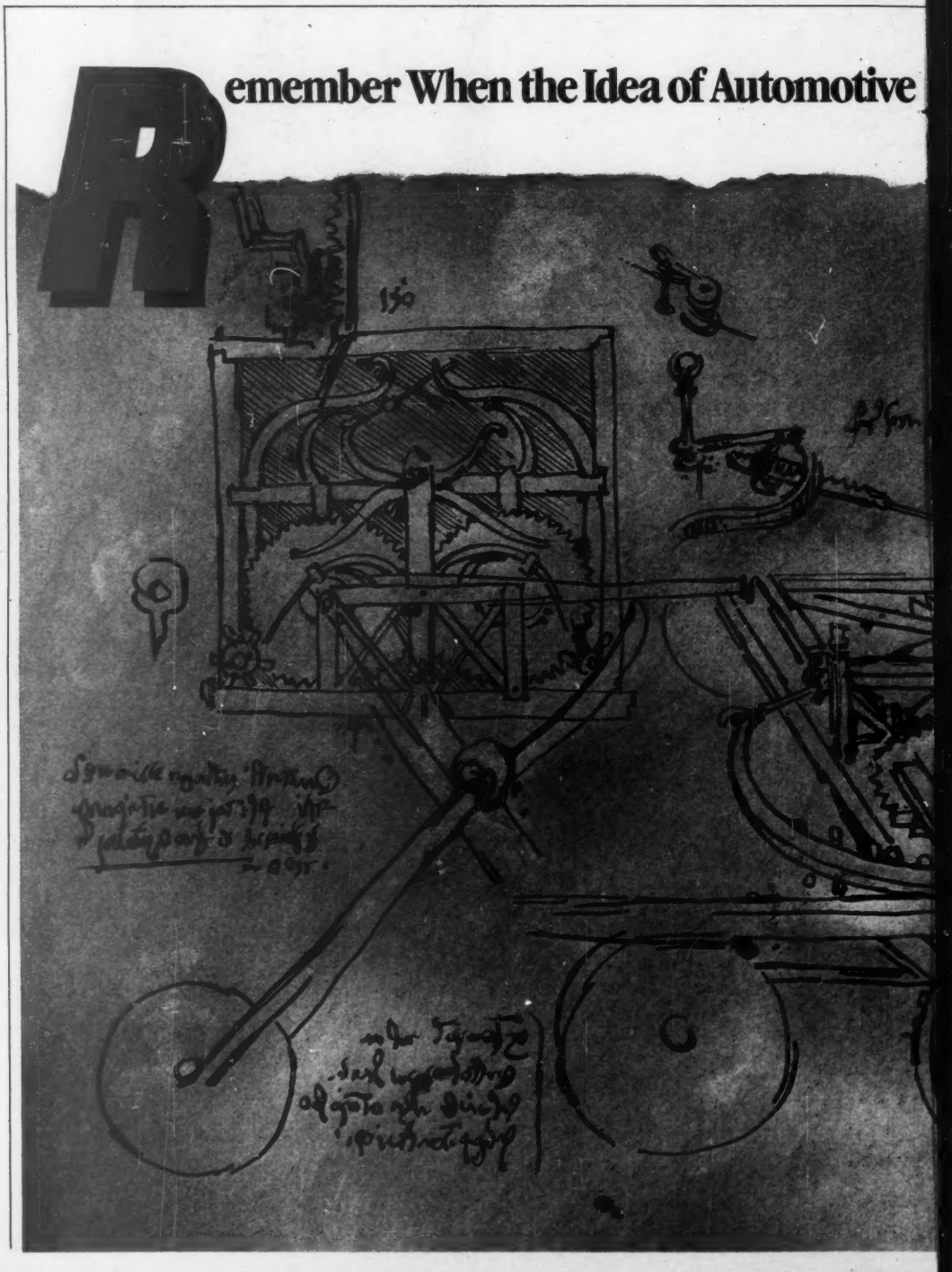
— The thing about my boss that most upsets me is . . .

— The thing I don't understand about my boss is . . .

— As a boss I would never . . .

— As a boss I would always . . .

Your answers should give you useful information about friction areas with your



> ***Don't make the mistake of putting too much emphasis on managing your boss and not enough on managing your own job. Your boss is most interested in the quality and consistency of your performance. If you are not doing the job you're expected to do, managing the boss better probably won't help one bit.***

boss, how well you understand what the boss is up against and how much you're aware of areas that need improvement.

For instance, if your answer to "My boss could get more out of me by . . ." is "giving me more responsibility for user contracts," ask yourself why this isn't happening now.

If it is because you have not made your wishes clear, you have to take the responsibility to make it happen.

But if it is because your boss is unwilling to entrust that contract to you, take a hard look at what you can do to earn that trust — and then approach your boss with a well-developed plan.

Now, let's look in detail at Alex, Lee and Steve and the three major areas of managing the boss.

In your boss' shoes

The first area involves gaining an understanding of your boss' goals and objectives and being aware of some of the problems and pressures a boss faces.

Alex couldn't figure out why his boss was not more enthusiastic about Alex's accomplishments with the product manager. One explanation — although there could be many — is that Alex did not realize how his boss views that manager and his role. Consider these possibilities:

— Alex's boss and the product manager aren't getting along, and Alex's efforts to make inroads in that area are like rubbing salt in his boss' wounds.

— Alex's boss knows that limited resources mean he must allocate his staff's time carefully. If the company's marketing division does not account for much sales volume, maybe it would make better business sense for Alex to spend his time elsewhere.

If you can stand in your boss' shoes and profile the world from that point of view, you're going to perform your job better.

"When a subordinate tries to see things from the boss' viewpoint, it's an opportunity to learn and grow," explains Mary Alice Johnson, information center manager at Mutual Benefit Life Insurance Co. in Newark.

"If I as the boss feel my subordinates are trying to understand my situation better, our work relationship improves."

To see how well you can stand in your boss' shoes, try answering the following questions. If you have trouble coming up with replies, it might pay to do some digging to uncover what's important to your boss and act accordingly.

- What are my boss' three most important priorities?
- Who are the three managers (in areas we deal with) with whom my boss has a good working relationship — and from which three is he most distant?
- What does my boss' boss expect of my boss — and how does that affect what my boss expects of me?
- What are the one or two things my boss is working on that are can't-fail projects or systems?

"You have to have a clear understanding of what the boss expects of your function," Pepsico's Deering warns. "For example, if the boss doesn't like to get calls from users who are upset when the data center has problems, you'd better make that a top priority."

The answers to the preceding questions can help you improve your relationship with your boss by tailoring your work activities to match what's important to the boss.

Alex, for example, would have been better off spending less time with that one

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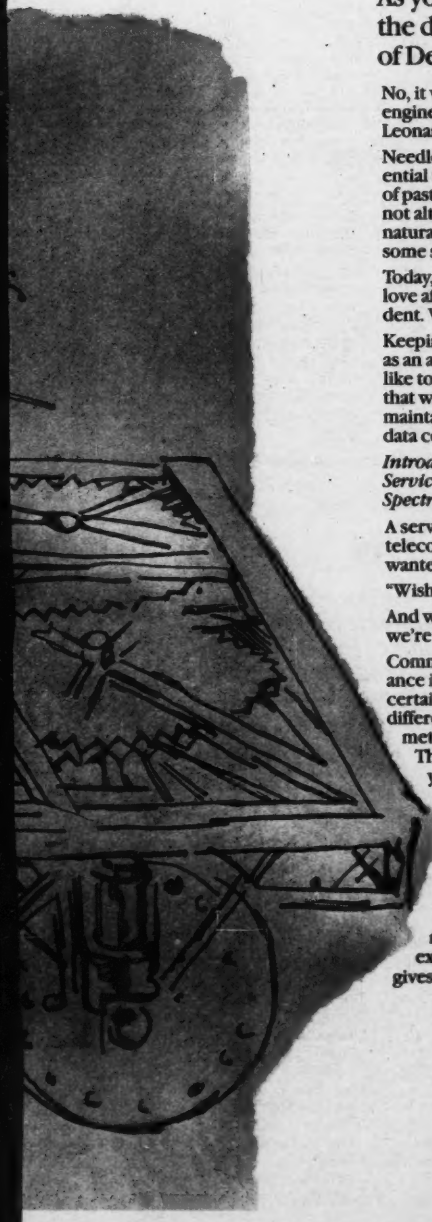

As you can see from the accompanying illustration, the differential transmission wasn't the brainchild of Detroit.

No, it was more like Italy. And the engineer was none other than Leonardo Da Vinci.

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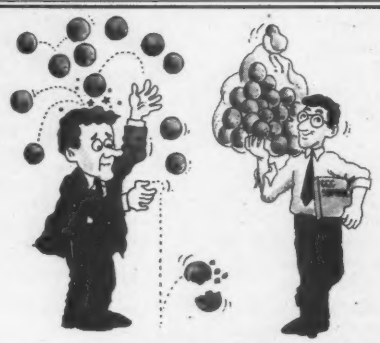

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The boss' style vs. your style

	My Boss' Style	My Style is Like/Unlike
Is the boss a listener (prefers to hear and talk) or a reader (prefers to read and write) when it comes to discussing ideas, problems or plans with you?		
Is the boss a preparer (prefers to plan and organize extensively before meetings or presentations) or an ad libber (prefers to do only minimal preparation and would rather work very informally)?		
Is the boss a doer (prefers to decide quickly on action steps and implement them) or a planner (prefers to analyze, review and plan in detail first before taking action)?		
Is the boss an exciter (tends to be very energetic, enthusiastic and expressive) or a stabilizer (tends to be more subdued, calm and show little emotion)?		
Is the boss a teacher (prefers to give out step-by-step instructions and coach in detail) or a resource (prefers to give only general guidelines then be available for help if needed)?		

This list shows five of the more common elements of work style, each characterized by two opposite extremes. Employees can choose the description in each item that best fits their boss, then note if their style matches that of their boss.

division or perhaps just calling less attention to his work there.

Turn skills into assets

The second goal is to look at how your skills compare with those of your boss and find ways to support your boss in areas where your skills complement the boss'.

If you are better at doing something than your boss is, you probably have seen times when you wished you could have stood in for the boss, as Lee did while her boss made the presentation.

Bosses and subordinates shortchange themselves if they won't play mix and match with their respective skills vis-a-vis their job requirements.

If you do something better than your boss, try to suggest that the responsibility be delegated to you the next time it comes up. Lee might offer to do part or all of the next presentation or just offer some tips for being more at ease in front of a group.

> ***"When a subordinate tries to see things from the boss' viewpoint, it's an opportunity to grow. If I feel my subordinates are trying to understand my situation better, our relationship improves."***
>
> — Mary Alice Johnson
> Mutual Benefit Life Insurance Co.

Be careful, though, that you don't give the impression of trying to upstage the boss. Stress to your boss the benefits — more time, less trouble, improved department image — of delegating that task as well as what is in it for you.

Make a list of several skill areas in which you perform a task better than the boss or do it as well but enjoy doing it more. These are the areas where you might be able to backstop your boss and make his life easier.

DP professionals must make special considerations when they find they are more knowledgeable than the boss is about the technical details. Deering points out, "People sometimes end up in this field with a boss who doesn't understand some of the technology. The subordinate has to do some training, but it must be done constructively, almost in a subliminal way. You can't act like the know-it-all, nor can you go to the other extreme and spoon-feed the boss."

Analyze differences and adapt

Here, the goal is to become aware of differences in your preferred operating style vs. the boss', and work to close the gap if possible or (more likely) adjust your style to that preferred by the boss.

There's an old cliche about managers' views on different styles: "There are two ways to do the job," the boss says, "my way and the wrong way." While some managers might still act this way, let's hope they are fast becoming the rare exceptions in today's business world.

Nevertheless, the boss does have a preferred way of doing everything from planning and problem solving to writing memos and arranging the top of a desk.

There is no need to mimic the boss; that can make everyone uncomfortable. However, there are certain areas in which major style differences can lead to problems (see chart above).

You will probably find that pinpointing style mismatches helps

explain problems with the boss. However, if you find that these mismatches occur, don't automatically assume you have to change.

Savvy bosses often look for subordinates who are different — they want the synergy that can result from those "Two heads (or styles) are better than one" situations. You only need to consider changing if the style differences are making you or your boss very uncomfortable or less productive.

In Steve's case, his tendency to act on his instincts might be a real plus in the day-to-day operations environment — if his instincts are right. He might tone down the impulse to act on his instincts or, better yet, use them to help sketch out the elements of a plan when dealing with his boss on long-range projects such as capacity planning.

Steve probably is not going to get his boss to shoot from the hip more often and will only create friction if he does not adapt his style.

Achieving a balance

Knowing how much to tell the boss and when to do it are perhaps the most critical skills of all.

"It's important to feed the right amount of information up, and it's all too easy to pass on too much of the nuts and bolts," Prudential's Farin says. "However, the other extreme is to keep the boss in the dark, and that's no good either."

Johnson of Mutual Benefit Life sums this up well: "I know that my people want to solve things themselves, and they don't want to feel like they can't handle certain problems. But they should at least keep me informed and know when to refer a problem that's beyond the scope of their skills or one that's in a sensitive area." ■

> ❞
>
> ***There's an old cliche: "There are two ways to do the job," the boss says, "my way and the wrong way." While some bosses might still act this way, let's hope they are becoming the rare exceptions.***

Working hard to be an asset

A topic as important and complex as managing the boss cannot be reduced to a simple checklist. However, some of the highlights of this process are as follows:

- *Do* put yourself in your boss' shoes and see what pressures, goals and priorities the boss faces.
- *Do* ask yourself how you can support and backstop the boss — what strengths, talents, relationships or resources do you have to complement what the boss has?
- *Do* look for clues about the boss' preferred work style — and adjust to that style if possible.
- *Do* work hard to be an asset to your boss; be reliable, know your job well and anticipate your boss' needs.
- *Don't* try to fool or evade the boss; you might win in the short run but lose in the end.
- *Don't* put the boss in a tough position; avoid complaining about things neither one of you can change, and don't make commitments to decisions that might embarrass the boss.
- *Don't* try to hide problems; you take a big risk when you keep something from the boss in the hopes that it will blow over.

— GIL GORDON

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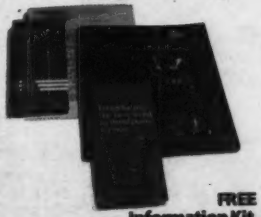

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In Depth

Speeding software delivery

Acceleration can make a large-scale project more costly, but the extra expense may be justified. Bringing a new system "live" one or two years earlier means reaping its benefits — savings, profit increment or market leadership — that much sooner.

By RICHARD LEFKON

One problem with large-scale programming efforts is that by the time the system is finished, the business it serves may have evolved into something distinctly different. Users will not stand by quietly without good cause if their key systems are frozen for a lengthy period to accommodate the programming department.

When time means money, time frame acceleration can make a large-scale project more costly, but the extra expense may be justified by return on investment and other considerations.

Unaccelerated, a typical system plan might call for four professionals to spend four years each to put in the new system or enhancement. But perhaps the business users cannot wait for more than 18 months to receive the working functions. Using a number of simple DP management practices — grouped under the strategy of concurrent phasing — can speed the process to meet the users' schedule, although at a higher cost.

The 16 man-years, originally spread over four years among four people, might appear at first glance to be covered easily in 1½ years by 11 or fewer people (since 1½ x 11 = 16½ man-years). In reality, management and interfacing costs would probably raise the required manpower to 13, 14 or even 15 people to get the job done in the shorter time.

Bringing the new system live significantly earlier means that the resulting benefits in savings, profit increment or marketplace leadership are cumulatively in effect for that much longer. Business users pay attention to this return on investment.

There also are operational benefits:

- Employee salaries and consultant costs will be billed at today's rates rather than increase steadily over time.
- The new system can use state-of-the-art software rather than, for instance, a data base package that has aged several additional years upon system delivery.
- The necessary freezing of present procedures will be shorter and cause correspondingly less disruption to the conduct of business.

Once upper management decides to pay for accelerating the project, the recommended strategy to accomplish this acceleration is concurrent phasing. This umbrella approach unites the concepts of subtasking; ganging, or grouping, and reordering tasks; team separation; data base definition; and modeling. The first three of these are best explained in terms of frequent milestones, ganged labor, checkerboard technique, documented interfaces and the phasing concept itself.

Frequent milestones

Progress should be measured as a count of successive milestones, not as an estimated percentage of work completed. Basic to the other practices discussed here is the need for dividing tasks finely enough. Avoiding any overly long tasks is especially important at project start-up, where it often happens that at least some tasks are inadvertently grossly underestimated.

For instance, consider two similar tasks: X, which is expected to take a week, and Y, which is scheduled for two months. Task X is inherently easier to manage than the longer Task Y. If Task X is running late, management will know by the end of that week and will be able to take action.

Even with the most competent and trusted programmer, no large task such as Y should be allowed to stand as is without negotiating a subdivision into one-week-or-less verifiable milestones. If this practice is new to the programming unit, a staff member may experience discomfort in the first such negotiation. It is up to the manager to persist in getting the programmer to identify and commit to each subtask.

A manager does well to offer supplementary staffing or reasonable added time for subtasks that, once isolated, are discovered to be more complex than originally assumed. This

Lefkon is an assistant vice-president and a programming manager for Citicorp Investment Bank, New York. He also trains corporate executives in DP management through regular courses and seminars at New York University's School of Continuing Education.

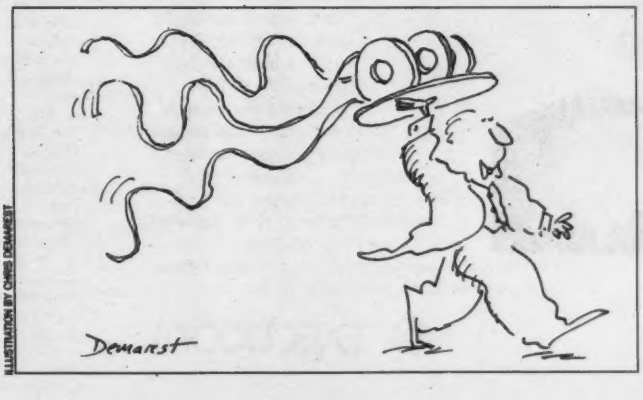

ILLUSTRATION BY CHRIS DEMAREST

> ***Even with the most competent and trusted programmer, no large task should be allowed to stand as is without negotiating a subdivision into one-week-or-less verifiable milestones. It is up to the manager to persist in getting the programmer to identify and commit to each subtask.***

combination of firmness and helpfulness makes the subordinate's next set of estimates more reliable and quickly conveys to all programmer/analysts the key role their own reporting plays in project control.

The manager does not have to inspect all the milestone evidence — or even understand clearly what all the bite-size subtasks entail. Because the potential for management inspection is always there, it is often sufficient to accept the word of the staff member that the subtask has been completed and verified in the standard way.

Thomas Conlon, now working at a large brokerage firm, recalls how subtasking helped solve problems with lateness and quality at Smith Barney, Harris Upham & Co. in New York.

"When I took over front office applications," he explains, "we had a real problem with timing and credibility within the Smith Barney Partners unit."

Conlon hesitated to depend on the close-mouthed senior programmer to start a large new subsystem for subledgers, account maintenance, payouts and unit split ups. Based on that expert's known rate of output, Conlon assigned three staff members to one of his project leaders, along with instructions to construct a schedule that exploded the main tasks into their smallest components and split the components up among the members.

All four staff members were available for fill-in work, but as things turned out, only two were needed at any given time, and the others performed different tasks.

"We got the required job done on schedule, and the user was really impressed with its quality," he relates. "I attribute a lot of that success to the fact that the milestones were small enough to be watched and accounted for."

Ganged labor

The time frame of a large task can be compressed, even though it appears to lie along one irreducible path. After subdividing the task into many pieces, its underlying structure — or lack of it — shows clearly where parallel programming can make use of ganged labor.

If there are two, three or four mostly independent processes, these can be transformed into the same number of programs that are written and tested simultaneously. A 15% to 30% programming overhead may be necessary to separate and reunite the function. Putting the dollar and resource cost aside, this means that splitting one program in half might reduce the number of days until delivery by 40%; in thirds, by 60%; and in quarters, by 70%.

Brian O'Shea, a consulting programmer at International Paper Co. in Denville, N.J., recounts his experience as a member of a coding gang at Citicorp, NA in New York. They were assigned to subdivide a large program for follow-up processing of complicated orders on a multimillion-dollar real-time system.

The program specification ran 79 pages in length, and O'Shea's coding group had established a rule of thumb of one coding day for any page of specifications received from that author. At 22 workdays per month, this one program would have spanned the entire time period allotted for coding all order entry and follow-up programs.

"This would have been a four-month effort if assigned to one person," O'Shea observes, "and the probability

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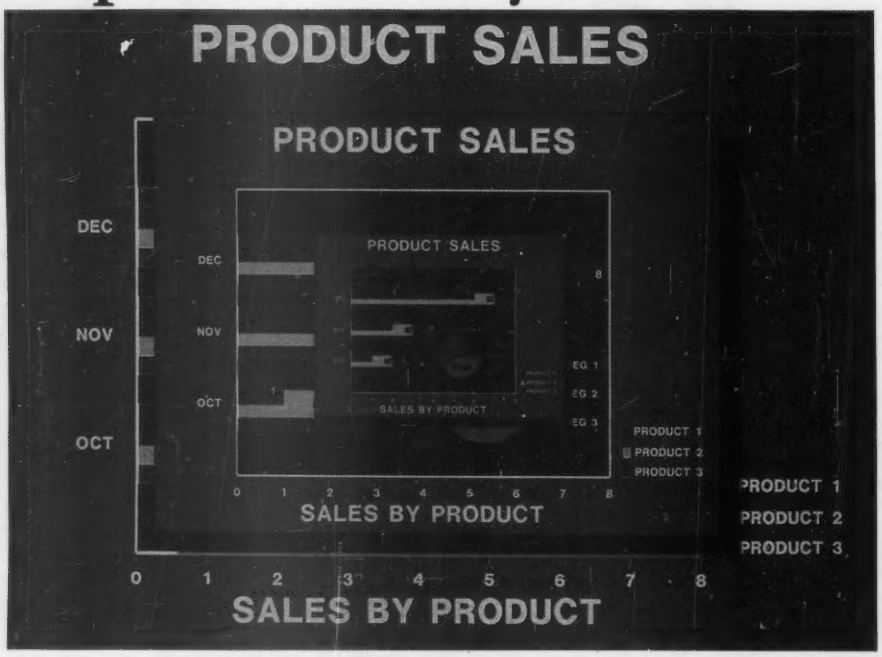

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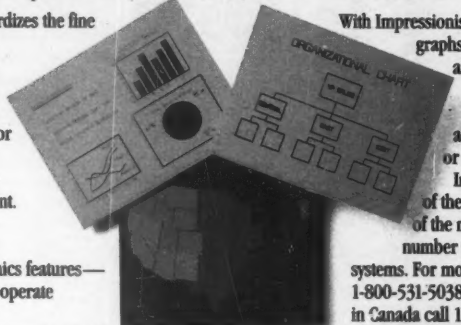

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of failure would have been appreciably higher" than with a ganged effort.

The specification was divided into eight distinct programs. O'Shea still smiles when thinking about the results: "Four-fifths of the original composite whole was up and running in systems in four to five weeks, and the remaining functions were implemented within two weeks after that."

The checkerboard method

Sometimes, the programmer is justified in insisting that the components of a large program are too interrelated for a clean separation. Even in this case, a complicated program can be subtasked using a two-dimensional, or checkerboard,

> ***After subdividing a task into many pieces, its underlying structure — or lack of it — shows clearly where parallel programming can make use of ganged labor.***

scheduling method. This is illustrated by a case study of the teleprocessing controller program in a sales processing system.

The controller program had originally specified and tested successfully for Subsystems A and B. Now was the time to add functionality for Subsystem C, restructure the controller so that common functions fell in a fourth section and modify all the pre-existing programs for Subsystems A and B.

One programmer would need two months to finish the modification and even more time to change the programs that used it — yet the deadline given was five weeks away.

In several negotiations during a two-day period, the manager got the programmer to subdivide the effort into nine tasks, each lasting approximately five days, plus the subsequent modification of old programs. The figure on page 100 shows the checkerboard solution reached. The downward diagonals of the checkerboard show how each subsystem component passed from programmer to programmer.

Programmer 1 did only coding. As soon as he finished a piece of controller code, other people would test it. As soon as the revised functions A, B and C emerged from testing, still other programmers modified the pre-existing programs and tested their own results. As things turned out, all milestones were made, with one exception: The initial version of the Subsystem C screen program was delivered four days late.

Clear interfaces

"Remember that kid's game, 'Telephone'?" asks Terrence Tener, computer operations shift supervisor at Gimbels & Co. in New York. "If the first person whispers unclearly, then all the rest have no chance of getting the message through. To avoid this miscommunication at Gimbels, we try to limit end users' direct access to the programmers."

The users talk instead to the systems leaders, who are more familiar with retailing. This way, a user's request is more definitively documented. "As a result of this," Tener adds, "the user specification is generally right the first time."

This technique of building a documentation wall between the business functional specifications and the rest of development differs greatly from ongoing program maintenance in a stable environment. In the typical programming maintenance department, a programmer/analyst takes his clipboard to the user's office to investigate a new business need and writes and obtains sign-off on functional specifications. Then he writes, discusses and obtains approval on a programming design and codes and unit-tests. Finally, he helps support the user test.

By contrast, a large-scale software development project needs clear interfaces with good documentation to fix responsibility and avoid backsliding. In the Gimbels example, the business analysts know that other hands will design and code the programs, and therefore the analysts must write more clearly and completely.

The practice can be extended to all stages of

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An advanced computer system for air traffic control is being designed to serve the U.S. into the 21st century. The new Advanced Automated System (AAS) will consolidate existing en route facilities and approximately 130 terminal facilities into 23 area control facilities throughout the country. It will automate many routine air traffic control activities now done manually. Computers will monitor and evaluate air traffic patterns and offer solutions to potential conflicts between airplanes in flight. AAS will include work positions and radar display terminals for controllers, powerful modern computers, and new software to run the redesigned system. Hughes Aircraft Company is designing AAS for the Federal Aviation Administration under a competitive contract. Hughes has built air defense systems for more than 20 nations, including the U.S., Canada, and NATO countries.

Programmable software formats within a night vision system for helicopters allow new features to be added as needed to meet new threats. The Hughes Night Vision System (HNVS) is a low-cost, forward-looking infrared system that provides excellent imagery and object detection day or night in all weather. It has extensive built-in test and fault isolation test capabilities. Among the features that may be modified to meet specific requirements are flight symbology, navigational data, automatic set-up mode, system status data, and push-buttons around the display face.

To meet the challenges of testing increasingly complex missiles, a test equipment design department at Hughes in Tucson, Arizona, has become a manufacturing operation within a larger manufacturing operation. The organization occupies about half of a new 106,000-square-foot facility that includes an office area, training rooms, computer center, CAD/CAM (computer-aided design/computer-aided manufacturing) center, engineering labs, and test equipment construction areas. With its own engineering staff, drafters, buyers, procurement follow-up group, production planners, clerks, technicians, and assemblers, the department has more capability than some small corporations.

Citizens of Mexico are communicating with each other from places never before possible, thanks to the new Morelos satellite network. The system provides advanced telecommunications to even the most remote parts of the nation and allows live TV programming to originate in at least 12 principal cities. Morelos carries educational and commercial TV, telephone and facsimile services, and data and business transmissions. The cylindrical satellite measures 7 feet 1 inch in diameter and 21 feet 8 inches high. Its solar cells generate more than 950 watts of electricity. Morelos is a version of the Hughes HS 376, the most-purchased commercial communications satellite in the world. It is the first HS 376 to operate in two frequency bands (C and Ku) simultaneously.

Hughes Ground Systems Group is applying its airspace management experience to the exciting challenges of worldwide air traffic control. These systems will be designed to ensure service 24 hours a day, 7 days a week. They will support distribution of processing among multiple computers linked via local area networks. The many challenges include design and development of hardware and software to support advanced display and man-machine interface technology, and using satellite technologies for future ATC applications. To help design the next generation of air traffic control systems, send your resume to Hughes Ground Systems Group, Employment Dept. S3, P.O. Box 4275, Fullerton, CA 92634. Equal opportunity employer. U.S. citizenship required.

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Checkerboard method of subtasks for rewriting programs

	Period 1	Period 2	Period 3	Period 4	Period 5
Programmer 1	Place common routines in one section	Place Subsystem A routines in one section	Place Subsystem B routines in one section	Produce a new Subsystem C routines section	Test the new Subsystem C controller section
Programmer 2		Test the common subroutines controller section	Test the Subsystem A controller section	Test the Subsystem B controller section	Write the first Subsystem C screen program
Programmers 3-8				Modify the old Subsystem A screen programs	Modify the old Subsystem B screen programs

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program development. If the analysts write unduly ambiguous specifications for Subsystem A, this will be known in time for them to be supervised more closely by their team leader during the planning of Subsystem B.

At each stage, a written handoff takes place. It is in each author's personal interest to make that product as complete and self-explanatory as possible; otherwise the originator will have to spend valuable time in face-to-face explanation and eventual rewriting for clarification.

In principle, each successive team should be able to receive a document thrown over a high wall by an anonymous author and to send its own product past the next wall to an equally anonymous recipient. The point is not that project members should not be sociable, only that no real turnover has taken place if sender and recipient must both be present to interpret the product delivered.

Concurrent phasing

Subtasking, ganging and tightly documented handoffs, along with the concepts of data base definition and modeling, can be synthesized into the overall scheduling strategy for larger tasks known as concurrent phasing of subsystems. Concurrent phasing is designed to keep all participants productively busy, permit resource shifts when problems arise and maintain a delivery schedule of highly visible subsystems that the business user can test, critique and ultimately approve for production. This integrated project management approach is at least 10 years old, having been proposed and reported by this writer in a 1975 National Science Foundation study.

Concurrent phasing is successful because of this; for example, it is not necessary to complete programming specifications for a given subsystem in the second project month if coding will not begin until the sixth project month. This fact is largely ignored in traditional development scheduling.

The traditional large development project schedule has fixed sequential phases for creating functional specification, programming design, coding, unit-testing, integration-testing and user-testing. This parallels the behavior of an individual maintenance programmer constrained to making small enhancements on a system that is already stable and settled.

Not only does the new development approach provide the freedom

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to vary traditional scheduling, but common sense and courtesy to the user community may also demand it.

In concurrent phasing, fixed teams are built around documents and programs to be passed downstream, business utility specification, program specification, programs and testing. In systems maintenance, the programmer/analyst moves through these four steps for each business function. In concurrent phasing, it is the business function, not the person, that moves.

The concurrent phasing of subsystems enables staff members to concentrate on doing only what they do well and supports real teamwork in which other staff members are made available as resources if a promise date starts to slip.

In the traditional approach, where all program specifications are written at one stage and so on, the business users suddenly appear in the last time period and are expected to validate and approve, in a brief interval, an entire system on which their livelihoods may depend.

This normal scheduling strategy is no better for the coders, especially consultants hired to implement the project. If taken seriously, traditional project phasing might require that all new programmers be screened (but not working) while business functional specifications are written, be paid to learn the environment while system designers write the coding specifications, work during the official programming phase and move on to other employment at the outset of integration-testing.

> ***Each team should be able to receive a document thrown over a high wall by an anonymous author and to send its own product over the next wall to an equally anonymous recipient. The point is not that project members should not be sociable, only that no real turnover has taken place if sender and recipient must both be present to interpret the product delivered.***

To say the least, the training time before the programming phase and the missing expertise immediately after it are, respectively, costly and extremely risky. Also, having all these programmers sitting at their desks does not guarantee the desired manpower in case of an emergency. This is because their slack times happen all at once and do not make any of them available to help during each other's busy times.

The use of a specialized coding team is assumed if the project size requires temporary staff expansion. But the constraint on staff members helping each other would be just as true for a slower project in which each subsystem was produced in sequence by programmers who all participated in writing functional specifications, designing programs and coding. Moreover, each programmer would tend to bog down at his weakest skill, while spending less time than planned where the greatest proficiency lay.

In the concurrent phasing approach, each business function rides a conveyor belt past the fixed teams. It receives a well-documented functional design from the business analysts; next, the system specialists read the functional specifications and place an unambiguous programming specification on the conveyor belt. Then, the programmers remove the specification and replace it with unit-tested programs.

The system testers either accept each program or have it improved, then place it back on the belt with a set of successful test cases that match the design documents. Finally, the functioning program drops into the users' laps for further validation.

These steps may sound similar to those of the traditional approach, but there are three striking differences: The conveyor belt is in a steady state; the project teams represent fixed stations at which each distinct business function must stop; and business functions or subsystems are phased in, not done all at once or done in spurts.

In the initial time period, while Business Need A is being analyzed, programmers are brought up to speed technically, and systems analysts can busy themselves analyzing the data elements of the pre-existing manual or automated systems. In the second time period, Business Need B is analyzed, the Business Need A functional specifications are transformed into a coding design for Subsystem A, and programmers experiment with a model system.

By the third period, programmers are working full-time implementing Subsystem A, while Business Needs B and and C are proceeding through analysis and design. In the fourth time period, Subsystem A is integration-tested, while business analysts begin to look at Business Need D.

Note that Subsystem A reaches the user at the start of the fifth period, before analysis of Business Need E has taken place. Each development phase is being done concurrently but for different subsystems.

Representatives of Business Department A, who worked with the business functional analysts at the beginning, return in the fifth time

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> ***In systems maintenance, the programmer/analyst moves through four steps for each business function. In concurrent phasing, it is the business function, not the person, that moves.***

period to critique a subsystem that has been demonstrated to hold together technically in accordance with written program specifications representing the original functional specifications.

If the Department A end users pinpoint an urgent fix requiring business analysts, system designers, programmers or testing personnel, these specialists can be assigned to this task because the time period imposes no particular stress on any of the specialized teams.

In concurrent phasing, end users thus become a dependable, regular component of the process, gradually increasing their skills and understanding of the system. They encounter no overwhelming surprise at the end of the project when they are asked to authorize a move to the production environment.

Data base comes first

Bad programming is not irreversible. Bad data planning may be.

For instance, two functioning batch Cobol programs can be combined for controllability by concatenating their respective divisions, recompiling to eliminate redundancies and retesting. One real-time Cobol program can be subdivided for paging efficiency, partial rewrite and so on by dissecting the procedure division, reproducing the other divisions in both places, recompiling to eliminate unused fields and program retesting.

If produced carefully, the combined (or bifurcated) program cannot be distinguished from one originally designed to exist in that final form.

This is definitely not the case with a data base or any systemwide data store, including one or more flat sequential files. Whether the major subcomponents of a system are programmed in sequence or in parallel, an extensive data base should be produced initially, tentatively populated and used uniformly by all system components.

From a design development viewpoint, early implementation of a comprehensive data base has four advantages:

- It facilitates modeling.
- It forces major functional components to communicate properly with each other.
- It prevents data redundancy, which is practically impossible to eliminate when combining two or more subdata bases later in the project.
- It forces the early planning effort to concentrate on and understand the meaning and use of the actual business data fields.

Cornelia Johnson, a programmer/analyst with Columbia Presbyterian Hospital in New York, remembers how this method was applied to patient management and patient accounting. "At Columbia Presbyterian, we were planning a major new subsystem for SWOPS, our social work outpatient system," she recalls.

Before starting any programming design, Johnson's team met several times with the end users and discussed the data elements that would be required to build the data base and write the reports.

Once the team had isolated the essential data elements, it prepared a hierarchical chart showing how many data base levels would be necessary to use and properly classify the required data.

"We finally loaded a small extract containing the segments that were needed in the data base," Johnson continues. "It was only after that happened that the programming phase began."

She points to the gain in

> ***"Many people think of models as something to be reused. But in modeling you rarely intend to run the original programs over and over forever. They are simply there to confirm, or refute, the logic or procedures on which you want to test feasibility or tuning characteristics."***
>
> — John LeKashman
> Chesebrough-Pond's, Inc.

programming efficiency and independence as the major benefit. "The health care programs and the accounting programs could be coded without cross talk since the data base was in the middle."

An additional benefit of sharing with a final data base (including embedded dummy fields for expansion) is that designers and programmers are encouraged to be as imaginative as possible at every stage of development.

Occasional upgrades can be made to the data structure to keep it complete and able to serve the ongoing programming effort.

Skeleton system

Critical as specifications are, it is a mistake to conclude that the programmers' hands must be idle while the first coding specifications are being produced.

All the new hires know the programming software, and each of the old-timers assigned to coding has expertise in the business, automated interfaces or data fields. Based on their collective expertise, the programmers can produce fairly rapidly a makeshift data store and a variety of conveniently coded programs for one or more of the planned subsystems.

"Many people think of models as something to be reused," says John LeKashman, vice-president of operations services for the Stauffer Chemical subsidiary of Chesebrough-Pond's, Inc. in Westport, Conn. "But in modeling you rarely intend to run those original programs over and over forever. They are simply there to confirm, or refute, the logic or procedures on which you want to test feasibility or tuning characteristics."

Formally, a usable prototype or skeleton system helps to start the coders thinking creatively toward the practical use of their work. It facilitates tryouts, modeling and some degree of tuning.

In microcosm, the toy system encourages old and new programmers alike to realize that they can successfully produce a meaningful system for that business.

In practical terms, this free exercise of a programming effort can uncover where supporting software and coding aids do not work. Also, other limitations of the environment and staff can be learned and acted upon before important deadlines appear on the horizon.

Presley Acuna, a systems analysis consultant, recalls his stint as project deputy on CRES, a commercial real estate finance system, at Chase Manhattan Bank NA in New York.

From the outset, his team constructed a skeleton system for prototyping that encompassed small components of the on-line inquiries, graphics subsystem, calculation modules and batch reports.

"The users got to play with the prototype system almost immediately, and as a result they were able to refine their concept of what they wanted," Acuna explains. "Happily for us, they were willing to classify newly added functions as Phase II or a later phase. By the end of Phase I, the system and the users matched. As a result of prototyping, we were able to produce the right system the first time."

Another vital use of such a skeleton system can be to reassure high-level business decision makers early on of the viability and ultimate profitability of a costly project that has just started.

At a major securities brokerage in New York, top management was suitably impressed by real-time prototypes of profit-loss and simulation screens. At that particular time, neither function was even anticipated, and the earliest coding specifications had not yet been finalized.

Management support needed

Represented schematically, a concurrent phasing diagram looks very much like the checkerboard matrix, except that Programmer 1 becomes Functionals Team, Programmer 2 becomes Design Team, Programmer 3 becomes Programming Team and a line is added for Systems Test and for Business Users.

The contents of each box in a concurrent phasing scheme would, of course, be a magnitude larger. The entire process currently illustrated in the checkerboard diagram would be summarized as Code Subsystem C and occupy only the white box on the right side of the third row.

The first column of such a schematic diagram for concurrent phasing would list Business A Functions (for the analysts), Analyze Data Elements, Construct Skeleton System, Set Up Testing Environment and Business A Functions (for the end user).

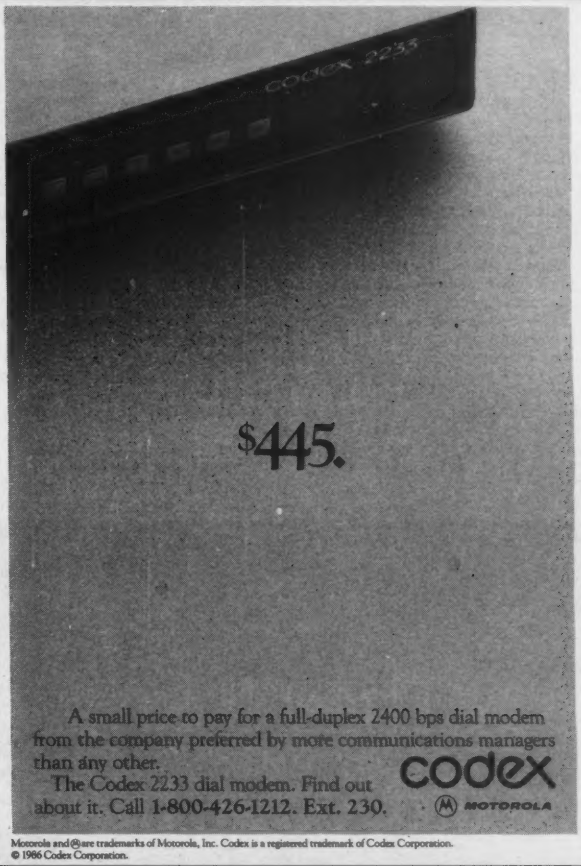
A two-dimensional checkerboard would be inappropriate to represent the more traditional scheme of large system development, since the main business needs are all to be analyzed at the same time, specified for programming at one subsequent time, coded simultaneously, integration-tested all at once and user-tested at the very end.

An active team

The additional dimension of a concurrent phasing diagram illustrates the need for an active project management team.

Once they understand the rudiments of concurrent phasing, task supervisors should be willing to carry them out, since they have already benefited from them.

The typical 60% decrease in project delivery time has necessitated a tripling of their staff size and may have precipitated their own hiring in



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the first place.

However, more senior management may be unfamiliar with concurrent phasing and at first may have difficulty conceptualizing this management-intensive method. It is important that this accelerated approach be presold to those with systems influences in either the data processing or end-user departments and explained carefully as new individuals enter the management chain.

A simple memorandum format can be used to express the worth of the management practices involved in the concurrent phasing approach in projects with individual budgets set as high as 150 man-years and $10 million. Such a memo, circulated in one's own department and subsequently discussed with key users, can offer the following recommendations:

- A prerequisite starting point is a complete set of known data items.
- The first internal product delivered should be a comprehensive data base — thinly populated but logically complete.
- Before formal specifications, coders should construct a skeleton of the full system for tuning and hands-on feasibility studies.
- Major subsystems should be planned, designed and coded and tested with phased starting points. This will leave the three teams intact throughout, guarantee written team-to-team handoffs and minimize misuse of staff such as coders interviewing users, CICS learners designing systems or user contacts writing code.
- The management and staff of each team should work together to report progress based on the smallest components of each task and to gang labor on critical-path items.
- To facilitate phasing, a list of cumulative features for subsystems should be enclosed.

Limitations

Except for subtasking, the synthesis of techniques discussed here will not produce the projected acceleration with projects of less than four to six man-years. Projects of this duration have insufficient resources present to facilitate ganging; in addition, the complexity of the task is probably not great enough to reap a net time gain from prototyping. Also, the project management team must take an active role, meeting at least weekly to discuss problems and alternative solutions.

Because it runs counter to the traditional linear schedule, concurrent phasing should periodically be discussed with those to whom it has already been explained. A loud "This method will never work!" can decelerate progress if left unanswered enough.

On the other hand, common sense should be applied. Coders should be discouraged from breaking up a program in circumstances where the time lost for component linkage coding and testing is comparable to the time gained by coding in parallel. Subordinates must understand that the deadlines are real and that 80% completion is not good enough.

Finally, if a new software technology is used, veteran practitioners of only the old technology should be kept off the program design team. Otherwise, their knowledge of the business, seniority and self-confidence may converge so strongly that they lead the real software experts to come up with the wrong system architecture.

When time means money

Concurrent phasing is a two-dimensional approach that integrates the management practices of task subdivision, subtask ganging and creating checkerboards, functionally distinct development teams, early completion of the common data base and extensive prototyping.

This approach facilitates coordinated delivery of subsystems to the user as integral wholes. It makes testing, fixes and user sign-off much less awkward.

The chief benefit of concurrent phasing is that it smooths and reduces the staff load required to complete a software development project in a greatly accelerated time frame. The final software products delivered are not necessarily any better than those produced with other approaches, and completing a project in 1½ years with this strategy will cost significantly more than permitting the same project to take five years to go live. But when time means money in its impact on the business, this more expensive project management strategy may be just the right one. ■

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In Depth

Strategic systems planning shifts to data-oriented approach

A strategic planning methodology provides a framework within which the planning process can occur. But the methodology is not as important as the planning process, which must be molded to the specific structure and needs of each organization.

By ROBERT MOSKOWITZ

The traditional approach toward strategic information systems planning, which remains dominant in most organizations, emphasizes applications. In the last few years, however, a redirected emphasis toward data architecture has shaken strategic planning to its foundations. This new direction forms the basis for using information systems not only as a major element in strategic business planning but also as a source of competitive advantages.

Philip James, chief of the strategic information systems planning (SISP) group for Los Angeles County, observes, "Companies tend to let applications hang on until they're no longer useful. As people start thinking about data instead of applications, they discover ways to improve the old applications. Looking at data is a future-oriented rather than a past-oriented solution."

Strategic information systems planning tries to establish a direction for using and developing information systems resources to support an organization over a five-year time horizon. The applications-oriented approach to SISP looks at the work to be accomplished within the organization and develops a plan for automating all the tasks and procedures. This approach glosses over the potential value of sharing information across separate applications and does little to reduce redundancy of data and data processing resources.

According to James, "The applications approach is prevalent in most organizations today, primarily because it is the easiest to understand. Most departments are oriented toward applications in their everyday work, and they naturally fall into applications-oriented strategic planning almost by default."

The applications-oriented approach historically leaves an organization with a portfolio of slightly different and incompatible applications, even where they use the same data. Users typically find they cannot compare reports across different applications because of slight differences, such as unequal reporting periods, including or not including tax and so on. As a result, organizations generally move from an applications-oriented approach to a data-oriented one that emphasizes data consistency across all applications.

James explains, "Moving toward a data orientation requires a large investment to organize and understand your data, but then your investment in successive applications will be much lower; the applications approach leads to a lower investment now, but you pay for it in spades later."

Revising current applications to conform to a data orientation is an immense undertaking. Organizations normally migrate gradually from applications-oriented to data-oriented strategic planning, implementing new applications according to the requirements and recommendations of the data-oriented plan but retaining current applications where doing so remains cost-effective.

Moskowitz is a writer based in Woodland Hills, Calif. He is the editor of the "Office Automation Update" newsletter.

ILLUSTRATION BY DAVE RIDLEY

Preliminary steps in planning

SISP requires a detailed analysis of the functions of various departments within the organization, the tasks of employees in these departments and how information processing systems can serve and support their needs. This type of basic understanding of the organization is a foundation common to all strategic planning methodologies.

The next step is to refine and develop the basic understanding of the organization to yield an information model — a simplified sketch of all the information in the organization, where it is

collected, where it goes and how it is used.

If an organization is pursuing a data-oriented approach, this information model can be further formalized into a data architecture, a hierarchical picture of information within the organization.

At its lower levels, the data architecture shows greater detail of the organization's various data bases — such as finance and accounting, manufacturing and operations, research and development and personnel and human resources — while at the higher levels it shows more general data characteristics and managerial perspective.

Descriptions of specific data are dependent on both hardware and software. Thus, information systems may be dedicated to sales, production, human resources and finances, but the data itself is conceptually independent of specific information systems.

The data architecture displays the general characteristics of data across the entire organization, omitting applications-specific details based on hardware and software systems currently in use.

Most SISP data architectures ignore nonelectronic information flows but remain important because the process of analyzing data flows within the organization is useful even if the resulting data architecture is somewhat one-sided.

Postplanning efforts

Regardless of what methodologies are followed, the effort required for the first SISP process is enormous. The study can take two years or more, although it is generally targeted for six to nine months. The final planning document contains specifications for applications and systems that should be implemented within five years or more.

Within a few months, the document begins its obsolescence. It requires annual revisions to reflect business and requirements changes both inside and outside the organization.

Revisions are made by repeating the SISP process, but they are typically less complex, less costly, less time-consuming and less cumbersome to formulate than the original strategic plan because much of the groundwork has been laid. Still, revising the complex matrices produced from IBM's Business Systems Planning (BSP) methodology, for example, can be very difficult.

Thus, software support is as important and useful for the SISP process as word processing, graphics packages and electronic spreadsheets have become for other business activities.

The role of methodologies

While there are a variety of methodologies from which to choose, a given methodology describes only part of the planning process and does not by itself determine the success or failure of the strategic planning project or plan.

James explains, "The methodology is chiefly important to provide a framework within which the planning process can operate. But the methodology is not as important as the planning process, which must be molded to the specific structure and needs of the organization."

William Synnott, senior vice-president for information systems at the First National Bank of Boston, agrees.

"We have used virtually all the strategic planning methodologies at one time or another. It isn't what methodology you use; it's whether you do it at all.

"The real problem is trying to get management, product managers and users to work interactively. In many organizations, the business plan is made without involvement of the systems people and then passed down to systems for them to give a reaction to it, Synnott explains.

"Instead, users and systems people should work together. In today's world, strategic business planning must include men, machines, money, of course, and also the information resource."

James observes, "If those who are driving the strategic planning process educate others in their organizations as to what the planning is all about and why it will be a good thing, virtually any methodology will yield a valuable strategic plan.

"But if process management is weak," he adds, "departing from the methodology generally loses whatever

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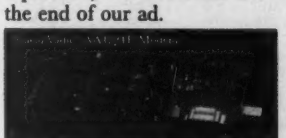

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coherence there is, and the strategic planning process tends to fall apart."

Formal SISP methodologies

Formal SISP methodologies seek to provide a framework and a process within which to accomplish the very difficult task of pulling together all the information systems in a large and often far-flung organization.

Business Systems Planning, developed by IBM in the mid-1970s, was one of the first methodologies to recognize the importance of a data-oriented approach to SISP.

The BSP process centers on a formal study that establishes an information system plan to meet requirements set forth by top management. The study attempts to define the organization's business processes and classes of data and analyze these in comparison with current systems support in an effort to identify relationships, gaps and redundancies.

> ***"Moving toward a data orientation requires a large investment to organize and understand your data, but then your investment in successive applications will be much lower."***
>
> — Philip James
> Los Angeles County

The final strategy is expressed in complex matrices showing the relationships of business processes to applications, to data and much more.

BSP has significant strengths, including its emphasis on data as an organizational resource, its involvement of top management and its advocacy of a modular shift from existing systems to the new ones. BSP encourages a look at data per se and at a data architecture, because it deals specifically with data classes apart from the applications that use the data.

However, the process is extremely costly and cumbersome to perform. Perhaps reflecting its decade-old origins, it studies the organization exclusively from a top-down perspective. In addition, its product — the matrices and diagrams — tends to be difficult to revise without software.

Because BSP studies the length and breadth of the organization, the strategic plan may overlook some specific details or application opportunities that would result from a methodology with a narrower focus.

Critical Success Factors (CSF), developed by John Rockart at MIT in the late 1970s, also requires heavy involvement from top management but puts greater emphasis on specific information needs.

Basically, CSF concentrates on the work done by particular managers or groups within an organization and focuses on identifying the tasks they must accomplish and the data they must monitor for the organization to be successful. CSF then concentrates on automating these tasks and creating reporting systems for the critical data.

One strength of CSF is that it puts most of the planners' energies into finding what is important and supporting that with information systems. Because this methodology emphasizes measurement and reporting on critical factors, it focuses on the quantitative aspects of the factors it identifies. However, certain factors are not amenable to quantitative description or analysis.

Edward McCarthy, vice-president of MIS at American Television and Communication Corp. in Englewood, Colo., recently used the CSF method for his company's SISP effort and observes that people within an organization may have a difficult time identifying its critical success factors with sufficient accuracy. Because CSF is so narrowly focused, he notes, strategic planners lose the comprehensive view and may overlook important elements.

Entity-Relationship Analysis (ERA) is a theoretical approach for building a structure on top of the data architecture or information model. In ERA, an entity is anything about which you collect information, such as a product, an employee, a department or a project. Each piece of information collected is called an attribute: a name, an address, a size, a price and so on. The entities are analyzed in relation to each other, such as an employee working in a certain department, a price belonging to a certain product or a number designating a certain customer.

ERA then tries to map the relationships among the entities in the organization, classifying them as "many to one," "many to many," "one to many" or "one to one" and using formal rules to develop a cohesive picture of organizationwide information flows.

ERA provides a picture of the enterprise that is detailed but not so highly technical that a general business person cannot understand it. It allows the planner to give each department its subset of the model and to show where it fits and how it interfaces with the others. Having defined the entities and relationships, the ERA-derived strategic plan can be converted almost directly to a data dictionary and a data base management system.

Managing an ERA diagram without a computer can be very complicated because of the amount of data that must be synthesized.

ERA nicely complements an established BSP effort because it looks at

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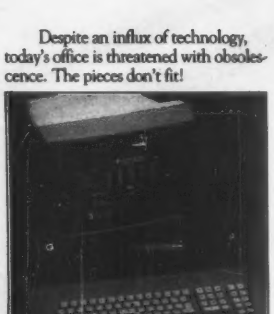

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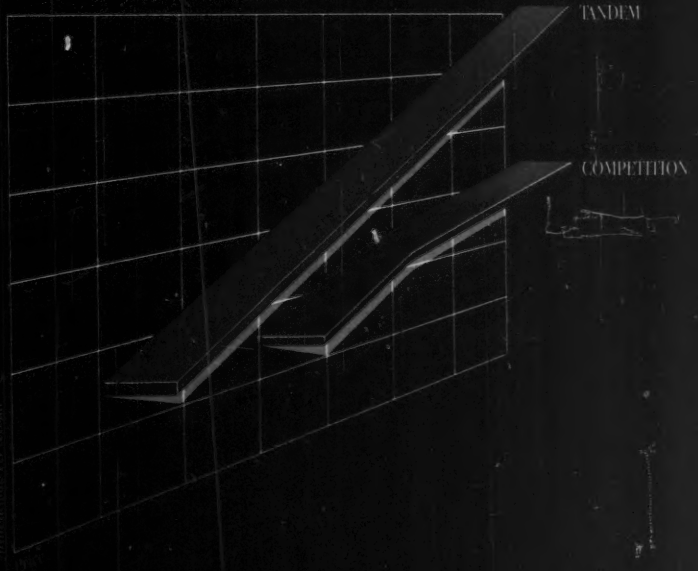

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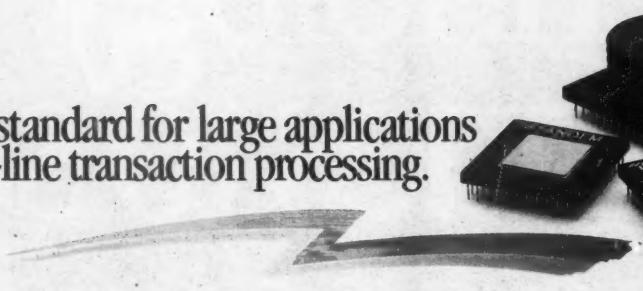

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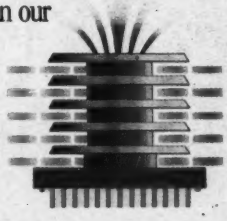

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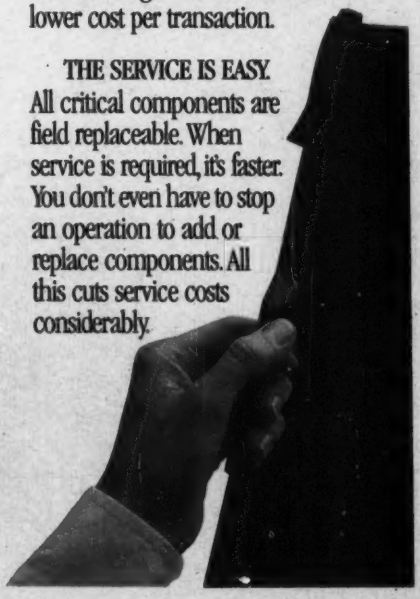

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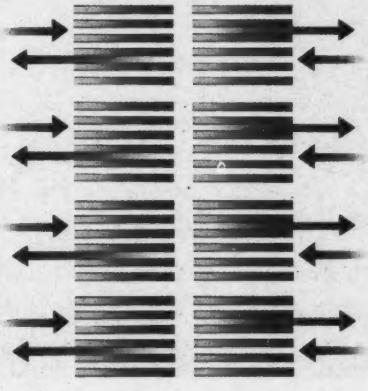

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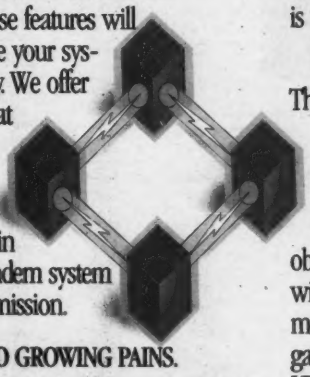

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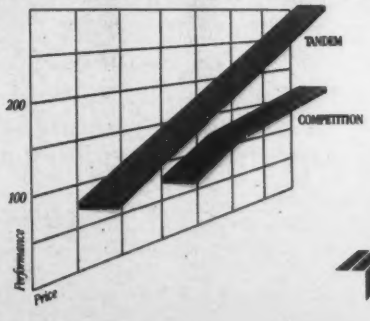

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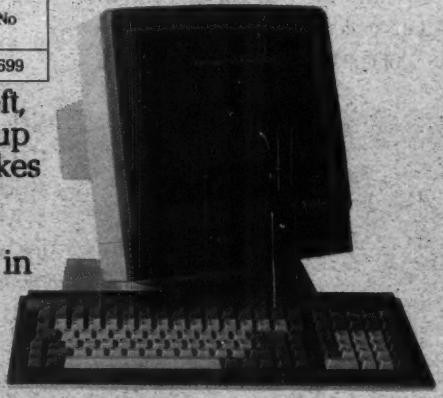

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According to Synnott, it is time to stop thinking about information systems as something that runs the back office or fits only a productivity-oriented business strategy and to start thinking of systems as competitive weapons.

the information somewhat differently. Planners may see problems or opportunities with both methodologies that they would not see with either one of them alone. However, introducing both planning methodologies simultaneously would probably promote a disaster.

The **Nolan Norton methodology** divides an organization into operational, tactical and strategic control areas and subdivides each of these areas into separate functions or processes. The methodology then deals with the application portfolio — the applications that support each function or process at each control level — and asks, What is the adequacy of support?

It provides graphic output in a colorful triangle that immediately shows where opportunities exist to increase information systems support of critical business functions. A new addition to this methodology tries to apply a CSF approach to determine which opportunities are most important.

The Nolan Norton methodology shares many of BSP's strengths, with the additional benefit of looking at several levels of controls very explicitly, a process that BSP does not do. However, the Nolan Norton process is extremely cumbersome and, like BSP, is comprehensive rather than focused. In addition, organizations generally need an expert to help them run the Nolan Norton strategic planning process.

Information Engineering was developed by James Martin, chairman of Ann Arbor, Mich.-based Knowledgeware, Inc. (formerly Database Design, Inc.) and a well-known speaker on information systems technology.

Martin defines Information Engineering as an interlocking set of formal techniques in which enterprise models, data models and process models are built up in a comprehensive knowledge base and used to create and maintain DP systems. SISP is not a major part of this process.

Information Engineering is often considered an SISP methodology, but Bank of Boston's Synnott contends, "It is more technically oriented, depending upon automated tools and trying to link specific approaches to systems building into an integrated methodology."

Portfolio Management is an even less formal methodology adapted from strategic business planning to SISP by Synnott and others. It attempts to divide an organization's information systems by the business potential of the processes they support and then to design appropriate systems strategies to match the relevant business strategies.

Portfolio Management focuses on three main types of business strategies:

- A strategy of product differentiation that requires the development of technologically innovative information systems.
- A low-cost production and pricing strategy that requires information systems to enhance productivity and keep costs down.
- The niche market strategy that requires comprehensive information systems support, in combination with one or both of the other information strategies.

Portfolio Management requires systems people to work with the strategic planning and marketing staffs. The methodology requires an organization to develop a completely different perspective on where it should place its systems.

The approach works well primarily in service industries; as yet, it does not seem to work as well in manufacturing, where the focus is on the product. However, it could help an organization build information value into its products by helping customers use the products better or provide better inventory control and order entry systems that are closely integrated with customers.

The Portfolio Management methodology embodies the new approaches to SISP, although any methodology can be used in this way. The methodology is already being implemented at Bank of Boston. Synnott and his team are planning to link business strategies to information strategies, a process that requires a different orientation from both management and systems people.

Better product, better service

According to Synnott, who is the primary driving force behind this new direction, it is time to stop thinking about information systems as something that runs the back office or fits only a productivity-oriented business strategy and to start thinking of systems as competitive weapons.

Synnott is not alone in his efforts to use information systems to build better products for customers and to focus on pushing information technology out of the organization to serve customers better. WTC Airfreight, Inc. in Torrance, Calif., for example, recently built a worldwide freight tracking system around the marketing concepts of supporting any systems customers might have and supplying them with the best possible information about any package, inbound or outbound, anywhere in the WTC system.

The same pattern has been followed by other major supply organizations. Banking is particularly active in pushing technology outside the organization — installing automatic teller machines on street corners and transaction terminals in supermarkets and even opening its phone lines to home banking systems. The current effort, clearly, is to use information resources as a strategic competitive advantage.

An evolutionary process

At Bank of New England in Boston, Phil L'Heureux, executive vice-president and corporate information officer, is actively involved in

strategic planning to integrate the systems of four separate banks that merged into Bank of New England last June.

L'Heureux put together what he calls "an evolutionary process" to do information systems planning. Basically, he pulled together groups consisting of major users of the systems — heads of divisions, branch areas, community banking, commercial lending and so on — and chartered them to merge their five-year plans into one comprehensive information plan.

One of L'Heureux's groups identified 18 short-term issues, ranging from payroll processing to ATMs, check processing and other traditional DP areas. It formed a task force of people close to the systems across the four organizations to plan where to consolidate systems and where to maintain separate systems.

Right now, the group is conducting a major planning conference intended to relate the bank's strategic business plan to a strategic information plan, with an emphasis on the 18 areas and on consolidation of the organizations. Already, a priorities committee at the bank has turned one-third of the 18 issues into projects that can be implemented, such as consolidating all trust processing over a three-year period.

L'Heureux notes, "The biggest question remaining is resource allocation among the various operating units and the central corporate structure."

He says his approach to planning is rapidly opening up channels of communication among the different banks. It also eliminates problems of centralizing the resources of all banks and running local information systems in Portland, Maine, or Providence, R.I., on a day-to-day basis from Boston. The decentralized, committee approach allows L'Heureux to use the existing strengths of each bank.

With the focus on applications at the bank level, the planning process emphasizes smoothing out dissimilarities. For example, six different installment loan systems are currently supported by six different sets of programmers; under L'Heureux's guidance, the bank will eventually move to one system, allowing it to double the resources for bank-level installment lending at less cost to the corporation as a whole.

A different strategic planning method is in use at Corning Glass Works in Corning, N.Y. Harvey Shrednick, vice-president of information services, has instituted strategic planning task forces covering the following areas:

- Organizational concerns, such as career path creation and skills training.
- Computer hardware and software.
- Telecommunications and networks for voice, data, image and electronic mail.
- Office automation — tools and services, personal computers, departmental processors and mainframes.
- Applications and applications development.

Each task force consists of seven or eight members, representing both staff and operating divisions of Corning, and meets in group sessions first to identify the major concerns and then to address the most vital areas. Members arrive with applications portfolios from their respective divisions and staff groups and try to analyze where Corning should be focusing its resources.

The task forces will make formal recommendations by early summer. According to Shrednick, these recommendations will constitute the key building blocks of Corning's information systems strategy.

Through the planning process, Shrednick's emphasis is on decentralization. He wants to let the task forces reflect the actual desires, information, knowledge and leadership in the divisions and not impose restrictions from the corporate center.

Corning Glass is a diverse and decentralized organization, he observes, and trying to set standards for data architecture for core and common applications would be an extremely difficult first step for strategic planning. "I specifically did not want to use a formal planning technology because people at Corning are not receptive to imposing a planning model. This approach gets our feet wet working as a synergistic team, and we can formalize the methodology later on."

Shrednick is pleased with the results so far. He says people are starting to work together to develop

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> ***"I specifically did not want to use a formal planning technology because people at Corning are not receptive to imposing a planning model. This approach gets our feet wet working as a synergistic team, and we can formalize the methodology later on."***
>
> — Harvey Shrednick
> Corning Glass Works

applications in common, such as a unique order processing system and a very sophisticated purchasing system. "We can do a hell of a lot more by linking our systems strategy to our business strategy, and by easing them into it this way, people are learning to be responsive to the needs of our business."

An exercise in planning

According to Ephraim McLean, who in cooperation with McKinsey and Co. is the author of a definitive survey on strategic MIS planning, it is usually incorrect to speak of how corporate information systems function as formal SISP methodologies. McLean, who is with the University of California at Los Angeles' Graduate School of Management, says, "Most corporate information systems planning is really an exercise in the application of strategic plans to business information requirements rather than a full-blown information systems planning methodology."

He feels that IBM's BSP is the original SISP methodology and that the others now proliferating in the field are simply specific applications of some or all of that methodology. He lauds BSP as the one approach with the totally integrated and thorough procedures required of a strategic planning methodology.

Not qualifying as true methodologies does not take away from the effectiveness of the other planning approaches when they are used properly, McLean points out. It merely places them one or more steps away from the rigorous world of formal strategic planning.

Why organizations don't plan

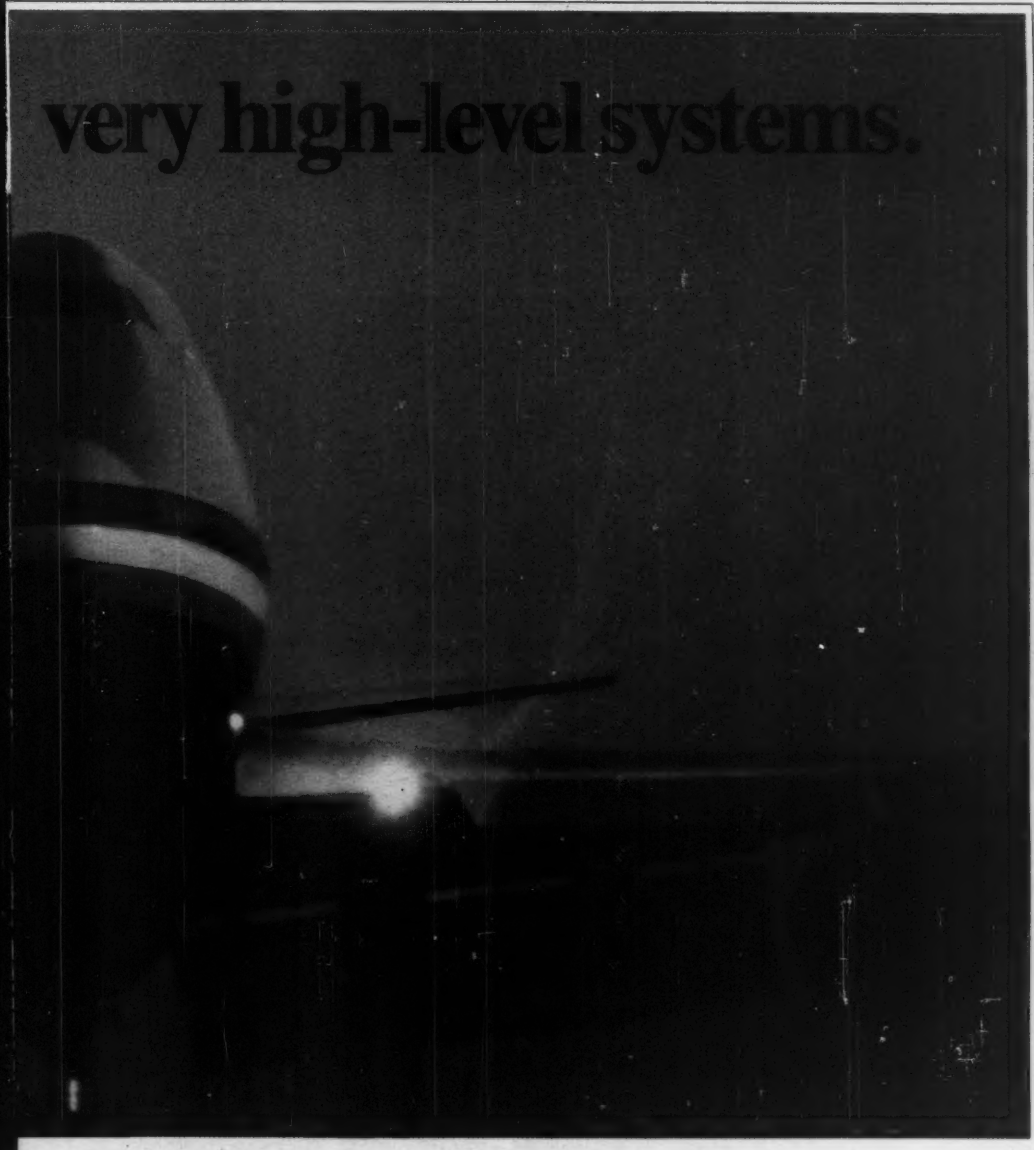
Not every organization conducts strategic information systems planning, even though strategic business planning in general has long been an accepted process at the highest levels of organizations.

This is understandable. Planning is frequently given a backseat to operations, and organizations quite often defer strategic planning even when they practice it in the short range. In addition, organizations attempting SISP often find their information systems personnel heavily committed to operational concerns, with little time to gain the perspective or do the groundwork necessary for strategic planning.

Moreover, strategic planning methodologies, while increasingly sophisticated and powerful, provide no ready answers or simple procedures for including the external factors — everything from the economic climate in which the organization operates to the hardware and software trends in business systems technology — with which strategic planning must deal.

SISP, nevertheless, is beginning to come of age in many large organizations. It has evolved not only as a necessary part of supporting an organization but also as a critical and very practical force in determining an organization's level of success, not an esoteric and relatively abstract exercise.

Strategic information planning is a massive undertaking for any organization, and formal methodologies are important to lend direction and purpose to the undertaking. But no methodology is adequate for the job if the organization lacks energetic information systems management with a clear understanding of the role and importance of SISP in modern business success. As one IBM strategic planning specialist has noted: "No SISP methodology solves problems. It simply helps you understand them better." ■



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NEW PRODUCTS

DEC unveils Vaxcluster Console tool

Said to aid management of Vaxcluster systems

Digital Equipment Corp. of Maynard, Mass., has announced the Vaxcluster Console System, designed to provide a centralized management and control facility for its Vaxcluster systems.

The Vaxcluster Console System is said to provide operators and systems managers with management functions that can be executed at a single terminal for control of up to 16 processor or storage controller nodes in a Vaxcluster system.

According to a company spokesman, the console system streamlines management of the Vaxcluster system by making the input from all nodes of the Vaxcluster system available simultaneously.

The console system's resources, such as automatic time-stamping of messages from individual nodes, allows the manager to optimize further Vaxcluster system operations, he added.

Microvax II linked to Vaxcluster

The console system incorporates one of DEC's Microvax II computers linked to Vaxcluster system nodes via fiber optics. It allows system management operations to be performed from any terminal of the Vaxcluster Console System, whether local or remote.

Additionally, individual node console status reports, which previously were printed out in hard copy, are now stored on a local disk at the console system, according to DEC.

A typical Vaxcluster Console System consists of a Microvax II computer with 5M bytes of storage, fiber-optic converters and power supply, fiber-optic cable and associated software.

Prices for the system start at $45,225, including a MicroVMS operating system license. Shipments are expected to begin in July.

Meridian DV-1 upgraded

Voice/data system gets graphics workstations

Northern Telecom, Inc. of Minneapolis has enhanced its Meridian DV-1 data/voice system with graphics workstations and the GEMDOS operating system and applications from Digital Research, Inc.

The Meridian M4100 graphics workstations include the Meridian M4120, with a monochrome monitor, for $1,995; the Meridian M4121, with a gray-scale monitor, for $2,295; and the Meridian M4122, with a color monitor, for $2,695.

The Meridian M4100 hardware includes a standard base controller with a minimum of 1M byte of random-access memory and a two-button mouse pointing device, an optional 5¼-in. disk drive, a 512K-byte memory board and an optional color matrix printer for the Meridian M4122 workstation.

In addition to GEMDOS, the new software includes GEM Draw, a picture editor; GEM Graph, a data graphing application; GEM Wordchart, a word chart editor; and GEM Collection, which consists of GEM Desktop, a graphics shell, GEM Paint, a graphics design tool, and GEM Write, a graphics-based word processing application.

According to a company spokesman, GEMDOS is said to be file-compatible with Intel Corp.'s 8086-based personal computer products.

On a per-user basis, the GEM Collection costs $199, GEM Draw and GEM Graph cost $249 and GEM Wordchart costs $149.

Northern Telecom's Meridian M4100 graphics workstations offer three monitors.

A site license is $1,600 for GEM Collection and $2,000 each for GEM Draw and GEM Graph.

The company also announced the DVIX V.2 operating system, its own version of the AT&T Unix System V Release 2, a 4M-byte Motorola, Inc. 68010 file processor and a 170M-byte storage unit to support DVIX V.2. This reportedly brings the Meridian DV-1 storage capacity up to 250M bytes.

In addition, Northern Telecom announced the X.25 gateway and the X.3 packet assembler/disassembler features that allow the Meridian DV-1 to communicate with packet-switched networks.

The price for DVIX V.2 is $1,700. The X.25 gateway is $1,595, amd the X.3 packet assembler/disassembler is $495.

The Meridian DV-1 is an integrated data processing and communications system. The Meridian M4000 terminals and workstations can access the applications of the Meridian DV-1 at a speed of 2.56M bit/sec., the vendor said.

Multifunction card out for IBM PCs

Omnitel, Inc. of Fremont, Calif., has introduced Omnipak, a single-board, multifunction card integrated with a 1,200/300 bit/sec. modem for the IBM Personal Computer, Personal Computer XT, AT and compatible microcomputers.

According to Omnitel, the card requires only one expansion slot and can be upgraded to 2,400 bit/sec. for future applications.

Omnipak comes packaged with communications and utilities software, such as random-access memory disk and printer spooler, reportedly enabling the PC to function as a communicating workstation.

In addition to the Hayes Microcomputer Products, Inc.-compatible 1,200/300 bit/sec. modem, Omnipak features 384K bytes of memory and parallel and serial ports.

Omnipak costs $499 and includes a two-year warranty.

INSIDE

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SOFTWARE & SERVICES

Systems software

Pilot Systems, Inc. has introduced **Pilot Distribution Software** for value-added distributors.

The Pilot Distribution Software operates on Unix-based systems.

It is composed of eight interactive modular subsystems for customer service, inventory control, purchasing, sales analysis, sales orders, accounting control, general ledger and value- added options, according to Pilot Systems.

Features include menu-selectable Help screens, extended credit system, customer service inquiry capability and duplicate customer purchase-order check.

The cost of individual modules begins at $1,500. The complete system starts at $13,000.

Pilot Systems, Suite 111, 125 Windsor Drive, Oak Brook, Ill. 60521.

■

Abacus Data Systems, Inc. has released **DM/3000**, a wholesale distribution-management software package for use with the Hewlett-Packard Co. HP 3000.

DM/3000 includes modules for sales order processing, inventory control, purchasing, sales analysis and general accounting applications. The software also handles mail orders, phone orders, counter sales and credit memos.

Users can enter miscellaneous and repair-service items for customer orders. On-line inquiry and print reports are available, according to the vendor.

DM/3000 is priced from $24,000 to $48,000.

Abacus Data Systems, 3166 Des Plaines Ave., Des Plaines, Ill. 60018.

■

Technical Software Services has announced the **Logger** system for Burroughs Corp. medium-system users.

Logger, written in Cobol 68, can operate in an on-line inquiry, update and maintenance environment or the batch update environment under MCPVI and MCPIX.

The system provides information of magnetic tape usage within a site's operation, such as library and data tapes as well as tapes created for information transport.

Reports generated include tape number order, tape name order, purge data order, cleaning date order, ownership order and storage vault order, according to Technical Software Services.

The batch-update Logger system costs $2,925. The optional on-line inquiry-update modification costs $1,030.

Technical Software Services, P.O. Box 753, Portland, Maine 04104.

■

Digital Equipment Corp. has introduced the **All-in-1 System for Employment Management**, designed for administering the employment process.

The system is an integrated set of software applications, including electronic mail, word processing, time and desk management and business applications.

Facilities include applicant tracking, job requisition processing, job matching, status reporting and employee self-nomination, according to the vendor.

The All-in-1 System for Employment Management is priced from $32,400 on the Microvax II to $174,000 on the VAX 8800.

DEC, 146 Main St., Maynard, Mass. 01754.

■

SAS Institute, Inc. has announced **Version 5** of the **SAS System** under MicroVMS, designed to support Digital Equipment Corp.'s Microvax II computer.

The SAS System includes base SAS software for data management, statistical analysis and report writing; SAS/AF for application development; and SAS/FSP for full-screen editing, query, letter writing and spreadsheets.

The system also includes SAS/Graph for information and presentation color graphics; SAS/ETS for planning, forecasting, financial modeling and row-and-column reporting; SAS/OR for project management; and SAS/IML for interactive matrix programming.

According to the vendor, the MicroVMS version of the SAS system is distributed via 9-track tape.

Annual licenses for each module range in price from $1,000 to $3,000.

SAS, Box 8000, SAS Circle, Cary, N.C. 27511.

Applications packages

Britz Publishing, Inc. has introduced **Release 2** of its **Bsign** banner and sign printing system for the IBM System/34, 36 and 38 family of computers.

New features of this release include enhanced menu and prompt screens as well as the ability to print banners in four sizes: 10½-in. by 12½-in. and three-quarters, one-half and one-quarter of that size.

According to the vendor, Bsign works with all System/34, 36 and 38 printers.

It is written in RPG II, and complete source code is included.

Bsign is priced at $29.

Users of Bsign Release 1 can upgrade for $19.

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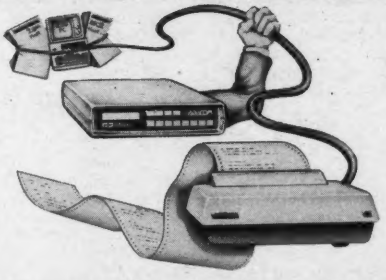

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NEW PRODUCTS/SOFTWARE & SERVICES

Successful Systems Innovators, Inc. has announced its **Purchasing System** for the IBM System/34 and 36.

System features include automatic purchase order generation, on-line access to vendor performance and item performance, reporting functions, five-decimal cost fields, alpha search capabilities by item or vendor and detail history of past purchase orders.

According to the vendor, all programs are multiuser and include full source code and documentation.

The package is priced at $4,000.

Successful System Innovators, 35-48 172nd St., Flushing, N.Y. 11358.

■

NBI, Inc. has announced **BRS/Search**, a full text keyword search system, and **Lexpert**, software for management of billing, accounting and administrative information in law firms.

BRS/Search is said to accept documents from most personal computer-based word processing programs. Any document from NBI's Oasys products can be stored on the BRS/Search system, which runs on NBI's 500 computer series products.

Lexpert consists of seven integrated applications packages for tasks such as general ledger, accounts payable and docket control. It runs on NBI's 510 and 570 multiuser computers.

BRS/Search will be available in August. It is priced from $18,000. Lexpert costs $18,900.

NBI, P.O. Box 9001, Boulder, Colo. 80301.

■

D&B Computing Services, Inc. unveiled an **interface** for its Nomad2 fourth-generation language data base management system.

The interface is said to allow users to run applications using Teradata Corp.'s DBC/1012 parallel processing relational data base machine.

It reportedly allows Nomad2 users to store larger sets of data with improved access time and lets a programmer writing or modifying an existing Nomad2 application to store and access data from a Teradata DBC/1012 machine via a simple two-word option.

The interface will allow users of Teradata machines to use Nomad2's fourth-generation language.

The Nomad2 DBC/1012 interface is priced at $10,000.

D&B Computing Services, 187 Danbury Road, Wilton, Conn. 06897.

■

CIS, Inc. has announced that its **Medusa** computer-aided design and manufacturing system will run on Digital Equipment Corp.'s Vaxstation II/ GPX.

Medusa offers two-dimensional design and drafting, parametrics for creating families of parts and a three-dimensional solids modeler.

Medusa on the Vaxstation II/GPX offers the power of the Microvax plus a separate very large-scale integration graphics coprocessor.

Users will be able to run concurrent applications using the product's multiwindowing and multitasking capabilities, the vendor said.

The Medusa Vaxstation II/ GPX system is priced from $40,000 to $50,000 for a single-user system.

CIS, 201 Burlington Road, Bedford, Mass. 01730.

■

Control Data Corp. has added **Shazam** from the University of British Columbia, **Premini** from K & H Computer Systems, Ltd. and three **Plot 10** graphics development applications from Tektronix, Inc. to the Control Data Network Operating/ Virtual Environment software base for users of its Cyber 180 computer systems.

Shazam is an econometrics software application for performing regression analyses, simultaneous equation estimations and principal components.

Continued on page 124

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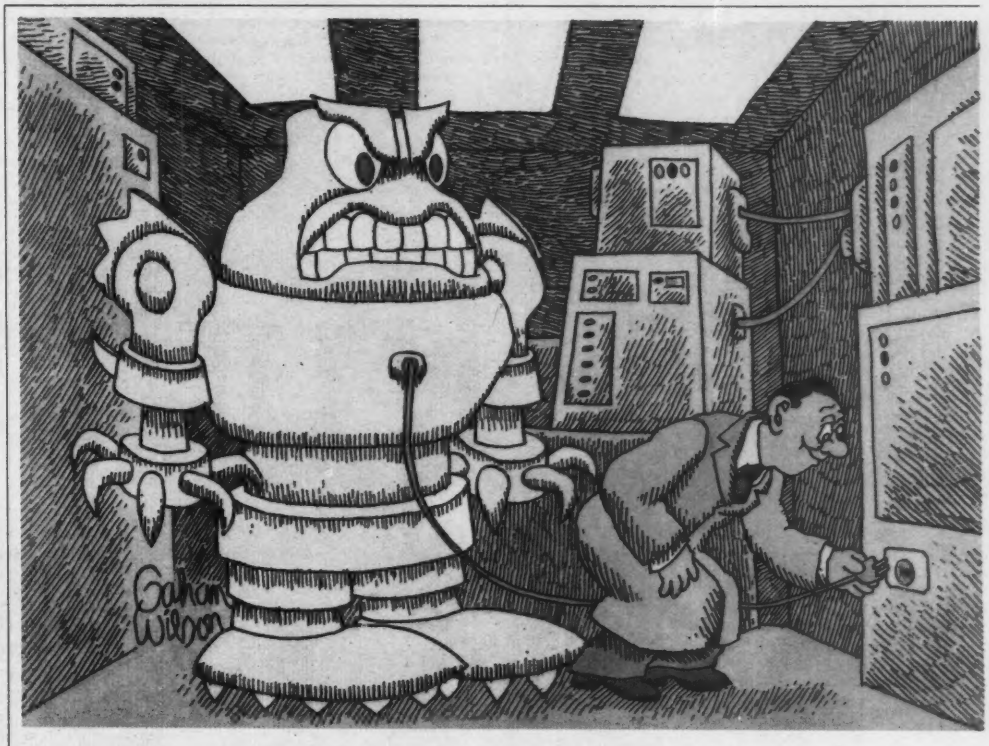

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Yes, I want to stop living dangerously.
☐ Send me details on the JCLCHECK program.
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Triangle Software Company

If you don't ask for us, you could be asking for trouble.

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Continued from page 123

Premini is a project-management application for setting goals and scheduling resources, according to the vendor.

The Plot 10 applications include the Plot 10 Graphical Kernal System, the Plot 10 Interactive Graphics Library and the Plot 10 Terminal Control System.

Shazam costs $900. Premini costs $20,000, and the Plot 10 applications cost from $7,000 to $25,000.

CDC, 8100 34th Ave. S., Minneapolis, Minn. 55440.

Languages

IMSL, Inc. has added the **PDE/Protran** language to its line of Protran software.

PDE/Protran is said to solve systems of linear and nonlinear elliptic or parabolic partial differential equations.

It reportedly handles a large class of time-dependent, steady-state and eigenvalue problems in general two-dimensional regions.

PDE/Protran is for Control Data Corp.'s 6000, 7000, Cyber 70, 170 and 180; Data General Corp.'s 32-bit Eclipse; Digital Equipment Corp.'s Decsystem-10, -20, and VAX-11; and IBM's 360, 370, 4300 and 3000 series.

A license costs $10,800 plus $400 for annual support. An annual license costs $2,000, renewable for $1,500.

IMSL, 2500 Park W. Tower One, 2500 City W. Blvd., Houston, Texas 77042.

Utilities

Sterling Software, Dylakor Division has announced **Dyl-Online under CICS/VSE**, a software product designed to provide CICS users with on-line access to Dyl-280 and Dyl-280 II, the company's mainframe information management products.

Dyl-Online allows users to define report requests on-line, with syntax checking, before submitting them for execution. Output can be viewed at the terminal, printed, purged or left in the output queue, according to the vendor.

Dyl-Online under CICS/VSE costs $6,000. A complete Dyl-Online system including Dyl-280 costs $17,000; including Dyl-280 II, it costs $21,000.

Sterling Software, Dylakor Division, 17418 Chatsworth St., Granada Hills, Calif. 91344.

■

Sterling Software, Dylakor Division has enhanced its **Dyl-260** fixed-form report writer utility.

Release 8.6 allows a virtually unlimited number of branch instructions. The previous limit was 1,024.

Dyl-260 Release 8.6 is available for IBM mainframes running under OS/MVS, DOS/VSE, VM/CMS and SSX/VSE. It is priced at $11,000.

Sterling Software, Dylakor Division, 17418 Chatsworth St., Grenada Hills, Calif. 91344.

■

Battelle, Columbus Division has developed **NLQ**, a natural language software package said to enable users of data base management systems to access information from a terminal by typing questions in English.

Features of NLQ include dialogue capability, retrieval heuristics and data base management system and domain independence. According to the vendor, NLQ is able to process complete, abbreviated or ill-formed queries.

Other functions include Help commands, synonym dictionaries, user prompts and spelling corrections.

NLQ is written in Interlist-D on a Xerox Corp. LISP machine. It costs $3,000.

Battelle, 505 King Ave., Columbus, Ohio 43201.

■

Syncsort, Inc. has announced **Release 7.3** of **Sydoc**, its software maintenance product.

Sydoc analyzes Cobol source code and produces a series of summary reports that break down a Cobol program's internal structure, relationships and logic.

Release 7.3 supports source programs that contain VS Cobol II language extensions. Several formatting options have also been added.

Sydoc supports IBM Systems 370, 3030, 4300, 3080 and equivalents running on OS/VS operating systems, MVS/XA, MVS/SP and VS1.

Release 7.3 costs $22,000 for five years.

Syncsort, 50 Tice Blvd., Woodcliff Lake, N.J. 07675.

■

Computer Associates International, Inc. has announced **Release 4.1** of **CA-Top Secret**, a data access security software package for IBM's MVS and MVS/XA operating systems.

CA-Top Secret Release 4.1 maintains compatibility and security support for recent releases of IBM operating environments such as CICS 1.7 and IMS 2.1. It also offers IMS/DB protection for both batch and CICS environments.

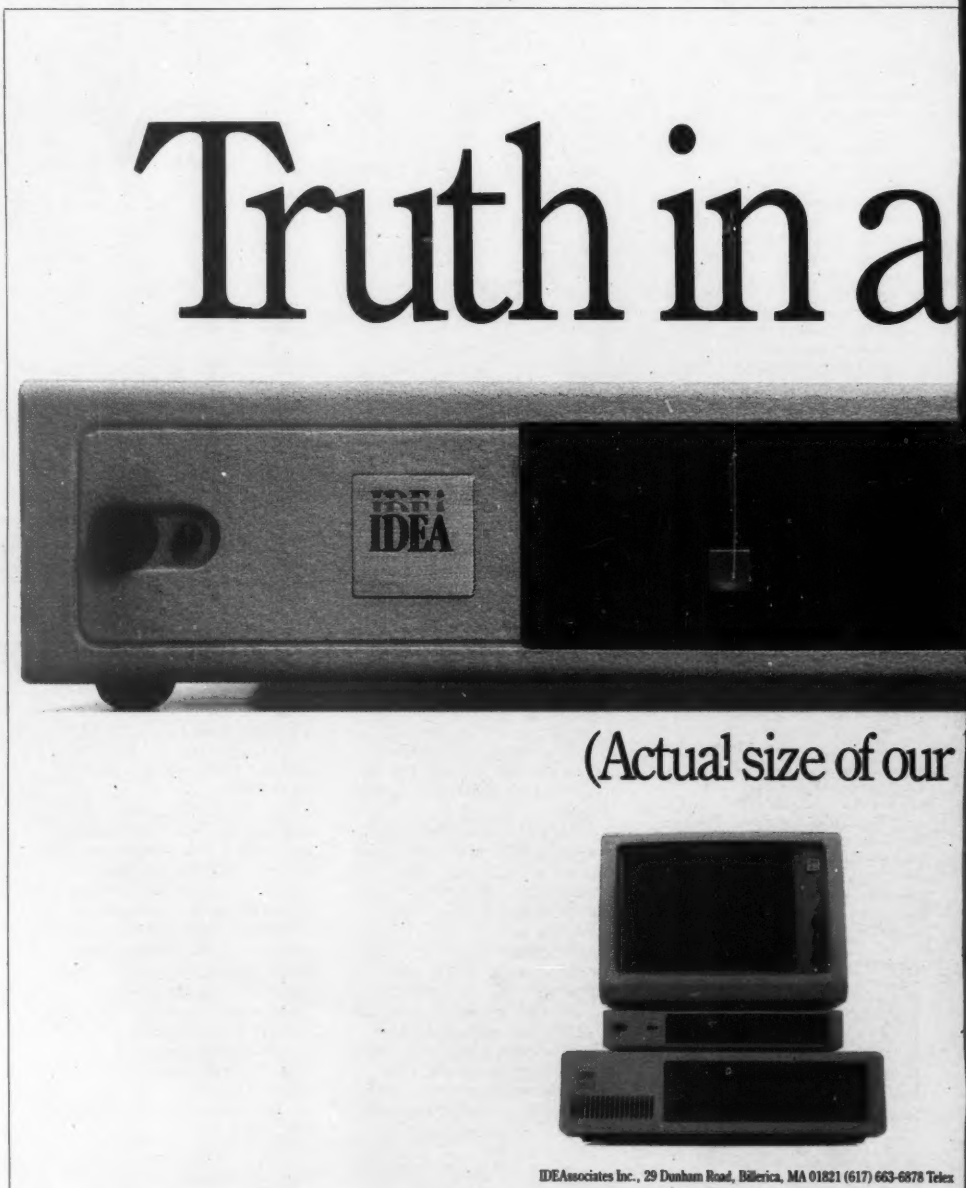
CA-Top Secret is priced at $37,000. A three-year lease costs $25,000.

Computer Associates, 711 Stewart Ave., Garden City, N.Y. 11530.

■

Hewlett-Packard Co. has introduced **HP Graphics Curator/3000**, a business graphics package said to allow users to access files from HP's host computer graphics with HP's Graphics Gallery software running on its Touchscreen personal computers.

HP Graphics Curator/3000 allows PC customers to use already created



graphics with no redesign required. Conversely, users may transfer picture files from the PC to the HP 3000 for integration into a slide or a word processing document.

HP Graphics Curator/3000 sells for $41,000 for use on the HP 3000 Series 37 and $2,500 for use on the Series 42, 58 and 70.

HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Training software

Giordano Associates, Inc. has announced its **716 C/Atlas** computer-aided instruction (CAI) package.

The package is based on the Joint Service 716 C/Atlas Test Programming Training Course. It was designed to train test programmers and test technicians in the requirements and use of the Atlas language.

The 716 C/Atlas CAI package runs on the IBM Personal Computer, Personal Computer XT or compatibles. It costs $2,500. According to the vendor, on-site licensing is available starting at $10,000.

Giordano Associates, 21 White Deer Plaza, Sparta, N.J. 07871.

Services

Datapro Research Corp. has introduced **Datapro Reports on Software**, a buyer's guide intended to help users select software for mainframe, mini and supermicrocomputers.

The service features reports covering data base management, communications, application development tools, data management, operating systems, performance monitors and security systems, systems enhancements and utilities.

Datapro Reports on Software is priced at $295. It is also available as part of the three-volume Datapro 70 series, priced at $919.

Datapro Research, 1221 Avenue of the Americas, New York, N.Y. 10020.

■

Intra-Systems, Inc. has announced **Systems Development Standard/Guidelines**, a one-volume application development methodology for data processing shops.

The publication is said to separate the systems development activities into manageable phases. It defines what tasks are performed in each phase and what documentation is required in each phase.

In addition, one section is devoted to standards and guidelines for the personal computer environment.

The volume is priced at $975 for the standard noncustomized format.

Intra-Systems, 13301 Green Valley Drive, Oklahoma City, Okla. 73120.

MICROCOMPUTERS

Systems

American Computer & Peripheral, Inc. has introduced the **American XTSR**, an IBM Personal Computer XT-compatible computer.

The American XTSR has a selectable clock speed of 4.77 MHz to 7.37 MHz. It uses a 16-bit Intel Corp. 8088-2 microprocessor and has up to 640K bytes of random-access memory on a four-layer motherboard.

Other features include eight expansion slots, automatic self-test at power up, Microsoft Corp. MS-DOS 2.11, two 360K-byte disk drives and controller, a color graphics or monochrome card and serial, parallel game port and real-time clock card, according to the vendor.

The American XTSR is priced at $2,560.

American Computer & Peripheral, 2720 S. Croddy Way, Santa Ana, Calif. 92704.

■

American Computer & Peripheral, Inc. has introduced the **American 286** IBM Personal Computer XT- and AT-compatible computer.

It features a keyboard selectable clock speed of 6 MHz to 8 MHz as well as a 16-bit Intel Corp. 80286 microprocessor.

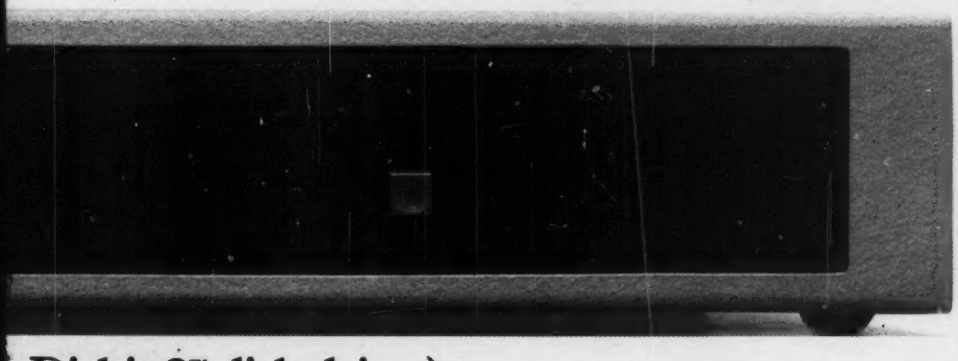
According to the vendor, it is expandable from 512K bytes of memory to 4M bytes and has six expansion slots.

Other features are said to include an automatic self-test at power up, 64K bytes of permanent, read-only memory containing BIOS. Two 360K-byte 5¼-in. floppy drives are also included.

The standard American 286 configuration is priced at $2,800.

American Computer & Peripheral, 2720 S. Croddy Way, Santa Ana, Calif. 92704.

dvertising.



Diskit 2™ disk drive.)

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Unlike every other disk drive, Diskit 2 fits inconspicuously under your IBM PC monitor. And that's precisely where zero footprint is the best footprint anybody can make.

Of course before our accomplished engineers made Diskit 2 revolutionary in size, they made it revolutionary in performance. With superior Winchester technology. And durable, plated media that lasts 11,000 hours, (that's 5 years at 40 hours a week) instead of the "100's of hours" you get from floppy media.

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Now allow us to make yet another guarantee. Every Diskit 2 comes with a full year warranty, not the industry standard of 90 days. It's just one more example of our corporate commitment. A commitment which means we are not content to merely enhance the IBM PC. We must advance it.

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IDEAssociates™

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NEW PRODUCTS/MICROCOMPUTERS

Canon USA, Inc. has announced the **A-200II Series** of IBM-compatible personal computers.

The floppy disk model includes a monochrome version of CRT, 256K bytes of standard memory, two 5¼-in. floppy disk drives, a Centronics-type parallel interface, serial data interface, six expansion slots and a standard IBM PC-compatible keyboard.

The hard disk model includes the same specifications as the floppy disk model but has one 5¼-in. floppy disk drive and one 20M-byte hard disk drive.

The A-200II Floppy Disk Model is priced at $1,995. The A-200II Hard Disk Model costs $3,595.

Canon USA, Systems Division, One Canon Plaza, Lake Success, N.Y. 11042.

■

Kimtron Corp. has introduced the **KW Series** of diskless personal computer workstations.

The KW-1 workstation contains an Intel Corp. 8088 processor, 4.77 MHz clock and 512K bytes of random-access memory (RAM). The KW-2 workstation has an Intel 8088-2 processor and 8 MHz clock speed. The KW-3 workstation includes an Intel 80286 processor, a 6-MHz or 8-MHz switchable clock speed and 640K bytes of RAM.

All three models include eight expansion bus slots, a monochrome monitor with video adapter card and an IBM Personal Computer AT-style keyboard.

Pricing for the KW-1, KW-2 and KW-3 is $995, $1,195 and $1,995, respectively.

Kimtron, Building 160, 1705 Junction Court, San Jose, Calif. 95112.

■

Tasvir Corp. has enhanced its **Supercads** three-dimensional, mechanical, computer-aided design systems.

The data structure of Supercads has been refined. Improvements to its design capabilities include upgrades to its Autochange features and its construction plane capability.

The turnkey IBM Personal Computer AT Personal Supercads cost $18,900. The Personal Computer-upgrade kit costs $10,000, including Supercads software, a Microsoft Corp. Xenix operating system and graphics board. Supercads Turbo, the Silicon Graphics, Inc. Iris workstation version, costs $44,900 for the turnkey system and $13,500 for software only.

Tasvir, 1091 Stielin Road, Mountain View, Calif. 94043.

■

Kaypro Corp. has enhanced its line of **IBM-compatible 16-bit business computers.**

The Kaypro 2000 laptop now has 768K bytes of internal memory and a larger LCD screen.

The Kaypro 2861 C IBM Personal Computer AT-compatible now has a hard drive that provides 30M bytes of storage. In addition, all Kaypro IBM-compatible units now feature Microsoft Corp. MS-DOS 3.2.

The Kaypro 2000 costs $1,995. The Kaypro 2861 C costs $3,995.

Kaypro, 533 Stevens Ave., Solana Beach, Calif. 92075.

Software applications packages

Usercom Systems, Inc. has introduced **U-Plan**, a business planning system for IBM Personal Computers.

According to the vendor, U-Plan provides a financial framework that supports analysis of various parameters and strategies.

U-Plan is priced at $485.

Usercom Systems, 2200 E. Devon Ave., Des Plaines, Ill. 60018.

■

Infomed Corp. has introduced a **pulmonary module** for industrial and clinical pulmonary screening and analysis for Burroughs Corp. Model B 25 computers with graphics capabilities.

The module provides diagnostic measurement and the ability to generate reports. The operator can perform pulmonary function evaluations including premedication, postmedication and shift tests.

Each module consists of an eight-liter, dry rolling seal spirometer, a separate interface module that connects directly to the RS-232 port of an existing B 25 as well as software.

The module costs $3,500.

Infomed, 13 Inverness Way S., Englewood, Colo. 80112.

■

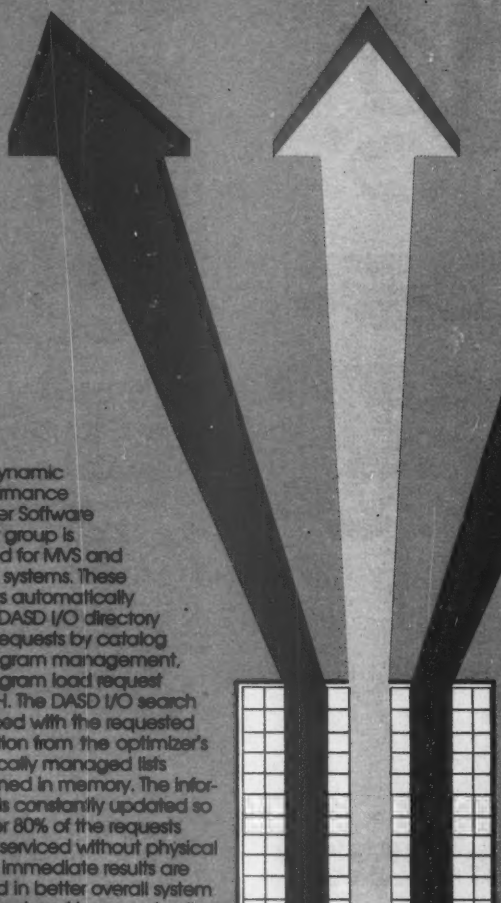
Hewlett-Packard Co. and **Lotus Development Corp.** have announced that HP will offer Lotus' 1-2-3 Release 2 for the HP Touchscreen personal computer family.

The Touchscreen version will incorporate HP's touch technology, allowing users to choose menu items and soft keys by touching the screen.

Other features include a spreadsheet with 8,196 rows by 256 col., direct Microsoft Corp. MS-DOS access, Intel Corp. 8087 coprocessor support and support for HP's Laserjet Plus printers, Thinkjet personal printer, HP2603 dot matrix printer

Continued on page 130

Improve Online System Response Times and Reduce DASD I/O



The Dynamic Performance Optimizer Software product group is designed for MVS and MVS/XA systems. These products automatically reduce DASD I/O directory search requests by catalog and program management, and program load request by FETCH. The DASD I/O search is replaced with the requested information from the optimizer's dynamically managed lists maintained in memory. The information is constantly updated so that over 80% of the requests can be serviced without physical I/O. The immediate results are reflected in better overall system throughput and improved online response times.

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● **Program Management Optimizer (PMO)** satisfies BLDL requests from program management more efficiently than either the BLDL or LLA methods.

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Now, users can run and develop IBM mainframe applications on the industry's most cost-effective departmental computer. The Canaan DCS 5800™ Departmental Computer lets up to 36 users run unmodified IBM 370 VM/CMS mainframe applications department by department, instead of on the mainframe.

It gives PC and terminal users fast response time and the full power of mainframe applications as well as database access.

COMPLETE COMPATIBILITY WITH YOUR EXISTING TERMINALS AND PCs

Cost effectiveness also means flexible connectivity. The DCS 5800 connects with the PCs and terminals you already have: IBM PCs, with or without IRMA™ boards, 3178/3278 terminals, DEC VT 100s/VT 220s and many other ASCII terminals.

And, of course, it lets departmental users share printers, disk drives, software and information all within their own work groups.

THE CONVENIENCE OF RUNNING EXISTING APPLICATIONS AND THE POWER OF DEVELOPING NEW ONES

The DCS 5800 won't disrupt users' workstyles—they still run the same mainframe applications they're accustomed to, including IBM's Professional Office System *(PROFS)*, fourth generation languages and decision support applications. Even IBM's *ISPF*, compilers, editors and debuggers.

Without requiring any additional training, MIS staffing or mainframe burden, the DCS 5800 also lets users develop and test *CICS* and *ISPF* applications in each department.

MULTIGATE™ DEPARTMENTALIZES MAINFRAME CAPABILITIES

Multigate, Canaan's family of communications software, integrates users, departments and MIS into a unified corporate information system, sharing information and applications.

Multigate PC "Plus" is an advanced PC communications software package that gives users the advantages of virtual disk capacity, pop-up menus and a complete PC application shell. Multigate 3274 BSC gives them additional transparent passthrough and logon with simultaneous sessions to VM and MVS mainframes. And Multigate LAN provides Ethernet communications at the departmental level among DCS 5800s and other minicomputers.

THE DCS 5800 DRIVES COSTS DOWN AND PRODUCTIVITY UP

Canaan's DCS 5800 provides immediate productivity with third party software we carefully test and certify for our growing library of commercial IBM 370 packages. Packages like FOCUS, RAMIS II,™ STRATAGEM™ and MODEL.™ All running on the DCS 5800 at a cost as low as 1/10th that of running them on a mainframe.

No other system is like the DCS 5800. It's the solution that users and DP/MIS can finally *agree upon* rather than compromise over.

The benefits are enormous, the cost is minimal.

Let us send you information on the complete story today. And you'll see why Canaan is the first choice of end users and DP/MIS alike to run departmental mainframe applications.

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Canaan Computer Corporation CW-5-12
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CANAAN

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Talk is Cheap. It's Performance That Counts.

Today's system software buying decisions will affect your company for years to come.

Before you select a vendor, talk to people you can trust.

If you're about to invest in system software for your mainframe, here's some free advice that may surprise you:

Go slowly.

The decision you're making will be felt for years to come throughout your entire organization. So don't try to shortcut the selection process.

And in particular, don't make a decision without talking to people with first-hand experience—the users of the products in question.

Naturally, we believe that Software AG products offer the best solutions available to the problems you face. And we'd like to have an opportunity to convince you—not by competitive claims and counterclaims, but by demonstrated performance in real-world customer sites.

In the meantime, we'd like to offer a few thoughts on some factors that contribute to performance.

Needed: integrated, long-term, worldwide solutions.

If you've been involved in data processing for any length of time, you already know more than enough about the dangers of piecemeal "quick fixes". You don't have to be sold on the value of integrated tools that meet a full range of organizational needs through a common syntax and shared procedures.

But while many vendors preach integration, few practice it on the scale of Software AG. From our core products, ADABAS and NATURAL, we have created an entire universe of software products that simultaneously meet the needs of everyone from MIS professionals to end users with no programming experience.

We're also integrated in another way—geographically. As more and more organizations seek to coordinate resources and data on a worldwide basis, they need a caliber of support that is consistent worldwide. Software AG's reach is unique among independent software vendors—with products installed in 52 countries.

Fourth-generation technology: Who needs it? Who's got it?

A lot of vendors have expended a lot of hot air on the subject of fourth-generation languages. And we'd be the last to deny that a well-designed 4GL like NATURAL can be a phenomenal productivity tool—as much as 10 to 20 times more productive than COBOL, for instance.

But the language itself is only part of the story. Because in committing to a fourth generation system, you're really committing to an entire technology for meeting your organization's needs. You'd better be sure that technology includes everything you need—from DBMS, 4GL, and data dictionary to end-user computing tools, office systems, micro/mainframe links, and intersystem communication facilities. If it doesn't, you may be looking at only a partial solution.

In any case, don't evaluate a 4GL by itself. Evaluate it in relation to the other products that are required to satisfy your total information needs. Do they share a common architecture or syntax? Were they designed together, or are they simply marketed together? And most important of all, how do people like working with them?

We *know* how people like working with NATURAL. After all, it's the world's most widely installed, widely experienced fourth-generation language—used by over 75,000 programmers. If you're looking for insights into 4GL technology, you might start by talking with one of them.

Industry surveys repeatedly rate Software AG #1.

It's one thing for a vendor to be proud of its products. It's another for an entire industry to share in that high regard.

Yet that's just what's been happening with Software AG products. For several years, *Datapro* and *Datamation* have both published annual surveys of system software users. And Software AG has repeatedly come out on top by a variety of yardsicks. That's not rhetoric—that's performance.

Software AG: high-performance vendor to over 2000 customers.

Because system software is a long-term investment for most organizations, it inevitably carries with it a long-term relationship with the software vendor.

And for many years, we and our users have recognized the importance of that relationship. In fact, we have worked together to shape it in the interests of delivering the best possible product performance.

But while we're glad our users take the trouble to respond to surveys, we have no control over their comments.

Which makes it all the more gratifying to see the survey results. And all the more imperative that you hear what users have to say—before you buy.

Just give us a call today. Or send in the coupon. We'll be glad to put you in touch with Software AG users in situations comparable to yours, so you can find out for yourself what industry insiders have known all along:

Anyone can talk. But when it comes to performance, Software AG stands alone.

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(DEC Professional Product Review, Feb., 1986).

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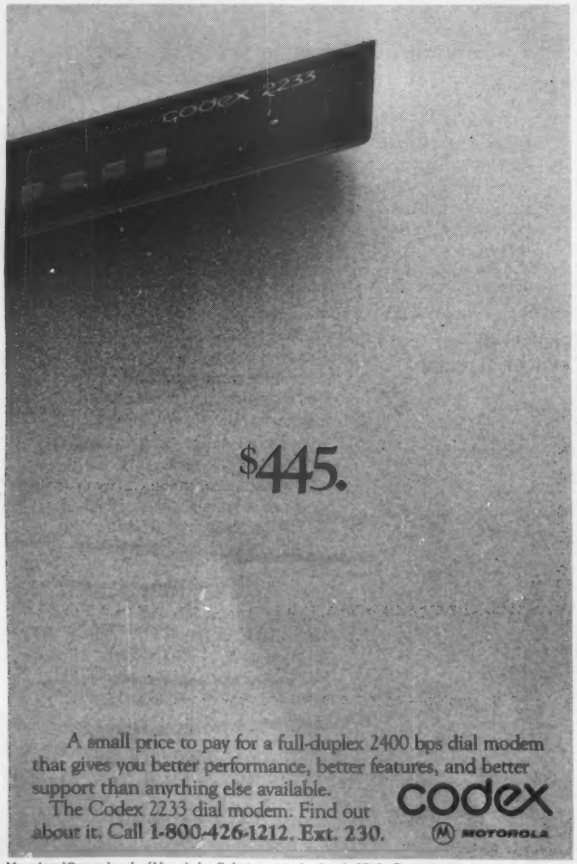

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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 126

and the HP Colorpro plotter.

The software is priced at $495.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

■

Time Arts, Inc. has released **Environment for Visual Art** (EVA), software designed for art and design creation on the IBM Personal Computer AT.

The system offers 32,000 colors, true-watercolor brushes, wet-on-wet effect, instant full color tinting and multilayering of transparent images.

Other features include a predictive pen, texture rendering and subtle airbrush effects.

Instantaneous capture of video images for manipulation within the system is integral, and a selection of fonts is available.

EVA costs $4,995.

Time Arts, 3436 Mendocino Ave., Santa Rosa, Calif. 95401.

■

PNC Information Systems Corp. has announced **MicroHRIS**, a menu-driven software system for automating human resources information.

MicroHRIS is said to automate benefits, compensation, history, training, payroll and a range of user-defined information. It is also said to feature built-in data verification and provides an interface to payroll systems.

The system builds on three database packages from Microrim, Inc.: R:Base 5000, Extended Report Writer and Clout.

MicroHRIS costs $7,500. A version for Digital Equipment Corp. VAX computers costs $20,000.

PNC, Pittsburgh National Bank Building, 6th Floor Annex, 5th and Wood, Pittsburgh, Pa. 15222.

■

National Management Systems has introduced the **NMS Personnel Manager's Workstation**, a human resources information system.

The system runs on IBM Personal Computers and compatibles. It is menu driven and features candidate searching, ad hoc reporting and automatic linking to Lotus Development Corp.'s 1-2-3.

It also features automatic linking to word processors, automatic electronic mail access via Compuserv, Inc., ad hoc global updating, full password and access-level security and file backup and recovery.

The standard version contains a relational data base structure of 170 data items organized in 19 files. It costs $4,995.

National Management Systems, 3337 Duke St., Alexandria, Va. 22314.

■

Nostradamus, Inc. has introduced **Instant Replay**, a software product for building product demonstrations, prototype sessions, professional presentations and interactive tutorials for the IBM family of personal computers.

According to the vendor, Instant Replay acts as a Microsoft Corp. MS-DOS or IBM PC-DOS shell with an integrated screen painter and prototyper as well as a key stroke memorizer capable of creating any application program directly or through generated menus.

It also features computerized presentation of standard text files.

Instant Replay is priced at $89.95.

Nostradamus, Suite 110, 5320 S. 900 East, Salt Lake City, Utah 84117.

Utilities

Simon & Schuster Software Division has announced **Webster's New World On-Line Thesaurus** for IBM Personal Computers and compatibles.

The program is said to contain 120,000 synonyms and phrases. It is random-access-memory-resident and compatible with more than 30 word processors. It is also compatible with software packages including Micropro International Corp.'s Wordstar, Microsoft Corp.'s Word and Lotus Development Corp.'s Symphony.

According to the vendor, the program recognizes common prefixes and suffixes. Writers can browse, scroll or flip through the software.

The Thesaurus costs $69.95.

Simon & Schuster, c/o Prentice Hall, Englewood Cliffs, N.J. 07632.

■

Softlogic Solutions, Inc. has introduced **Cubit**, a software program for IBM Personal Computers and compatibles designed to compress and decompress data files.

Cubit is composed of four programs: Cubit, the general purpose program; CubitR, a resident Cubit; CubitS, a switch program from resident Cubit; and Filchk, a file check program.

According to the vendor, users do not have to exit a program to pull up a compressed file.

Cubit costs $49.95.

Softlogic Solutions, 530 Chestnut St., Manchester, N.H. 03101.

■

Network Software Associates, Inc. has announced **RJEspool**, a printer spooling software interface product for micro-mainframe communications applications.

The product is said to form a transparent interface between the vendor's Adaptsna RJE micro-to-mainframe communications product for IBM Personal Computers, Personal Computer XTs and ATs and the Software Directions, Inc.'s PrintQ printing spooler for PCs. It allows the mainframe to transfer not only the files to be printed but also complete specifications and parameters.

The RJEspool software costs $185.

Network Software Associates, 22982 Mill Creek, Laguna Hills, Calif. 92653.

■

EZ Store has introduced **BackEZ** and **EZ Fix**, storage management products for personal computer-based systems.

BackEZ is a backup utility designed to transfer data from hard disk to any Microsoft Corp. MS-DOS or IBM PC-DOS recognizable storage device. EZ Fix is said to recover 100% of the information after an accidental format. It constantly monitors the activity of the disk, seeking changes in files and updating its own area directory.

Each program costs $99.

EZ Store, Unit K, 9421 Winnetka, Chatsworth, Calif. 91311.

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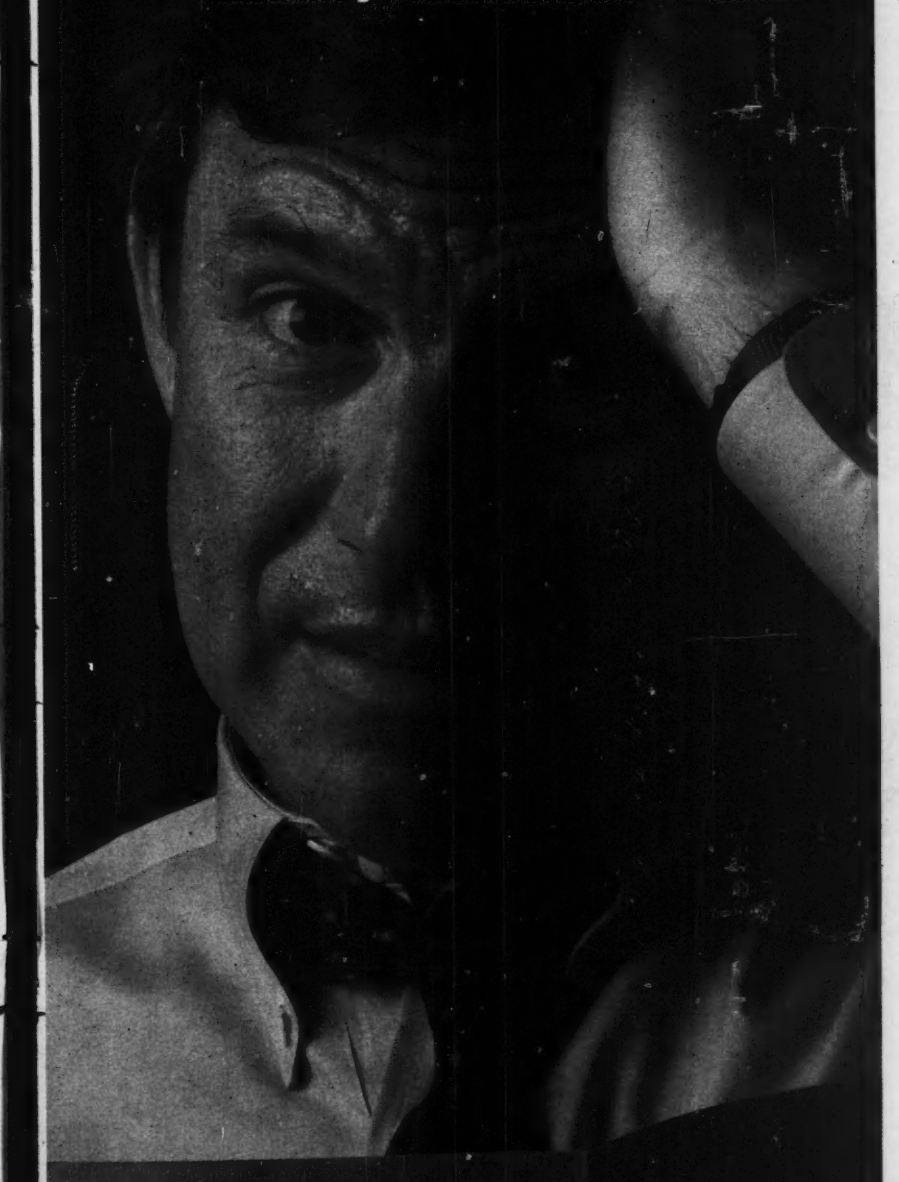

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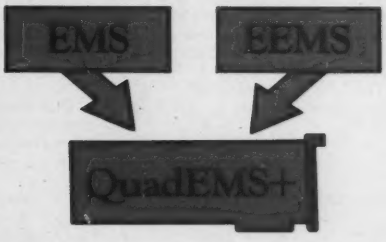

Memory And I/O

QuadEMS+ delivers 2Mb RAM when you move up to expanded memory. And supports both expanded memory specifications: EMS and EEMS. Each is independently engineered into the board. Plus, there's a printer port, communications port, and clock/calendar to enhance your system.

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Available now for your PC-XT and XT work-alikes, QuadEMS+ is easy to use. Just plug it in. It does the rest. It's designed to automatically configure itself to your system requirements. For more information visit the Quadram dealer nearest you. Or contact us at One Quad Way, Norcross, Georgia 30093; 404-564-5566.

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NEW PRODUCTS/MICROCOMPUTERS

Bourbaki, Inc. has released **1 Dir Version 3.5**, an enhanced version of its IBM PC-DOS and Microsoft Corp. MS-DOS shell utility software for IBM Personal Computers, Personal Computer XTs, ATs, 3270-PCs, PCjrs and compatibles.

The new version includes enhanced file management, improved mastery of MS-DOS and PC-DOS commands and operations and an augmeted menuing system that includes password security options.

The 1 Dir is priced at $95.

Bourbaki, 431 Main St., Boise, Idaho 83702.

■

Shannon Associates, Inc. has introduced **Metamorphosis**, a utility program for the IBM Personal Computer and compatibles.

Metamorphosis is said to translate any source program from one language to another. It also functions as a custom compiler, assembler, macro processor, query language processor, command languages processor, graphics language processor and report generator.

Metamorphosis is priced at $387.

Shannon Associates, P.O. Box 597, Chapel Hill, N.C. 27514.

■

Mountain Computer, Inc. has announced **Advanced Filesafe 4** tape backup software for disk drives.

The software allows users to back up all files or only those that have been added or changed. It can also restore files to a different directory on the disk or transfer them between tape or hard disk, floppy disk or over local-area network.

Version 4 is now standard on Filesafe Series 7000 hard-disk, tape and combo systems as well as on the TD-4000 40M-byte tape drive.

It is available to all registered owners of Mountain tape backup systems for $149.

Mountain Computer, 360 El Pueblo Road, Scotts Valley, Calif. 95066.

■

Delta Contracting Services, Inc. has announced **Cliplock**, a program said to provide record and file locking capabilities for Nantucket Corp.'s Clipper-compiled Dbase III, from Ashton-Tate, applications.

Cliplock is said to allow up to 10 users to share information on a local-area network, while ensuring that no more than one user can access a specific record at a particular point in time.

Cliplock is said to work with local-area networks from Novell, Inc. and 3Com Corp. as well as with Corvus Systems, Inc. Omninet, AST Research, Inc.'s PC-Net and Multilink.

Cliplock is priced at $99.95.

Delta Contracting Services, 150 Chestnut St., San Francisco, Calif. 94111.

■

Microplot has introduced **Toolkit**, a companion product for its PC-Plot-III graphics emulator software package.

Toolkit includes 11 utility programs that allow the user of PC-Plot-III to modify and draw pictures saved.

Some of the functions include Plotdev, a device driver; Sketchpad, which allows files to be edited and enhanced; Printplot, which produces 1,024 by 780 resolution plots on a dot matrix printer; Casprint, a version of Printplot; Lotustek, for converting graphics to Tektronix, Inc. format; and Hp Plot-III, a file conversion program and plotter driver.

PC-Plot-III and Toolkit cost $295.

Microplot, 659-H Park Meadow Road, Westerville, Ohio 43081.

■

CDI Systems, Inc. has introduced **Autokey/3270**, said to control IBM 3270 Personal Computer interaction from a personal computer command file.

The software accesses the screen-image buffer found on 3270-PC emulator boards and executes the commands in a command file by simulating the actions of a 3270 operator.

According to the vendor, Autokey/3270 users can automate entire logon sequences, repetitive input procedures and other applications requiring interaction with a number of 3270 screens.

The Autokey/3270 programmer's package costs $149.

CDI Systems, 2803 Butterfield, Oak Brook, Ill. 60521.

Software languages

Ryan-McFarland Corp. has announced its **RM/Cobol-8X** compiler for the Texas Instruments, Inc. family of IBM PC-DOS microcomputers.

RM/Cobol-8X is a Cobol compiler for microcomputers that offers portable applications code and high-speed execution. It includes IBM mainframe Cobol extensions and key features and allows virtually unlimited program size.

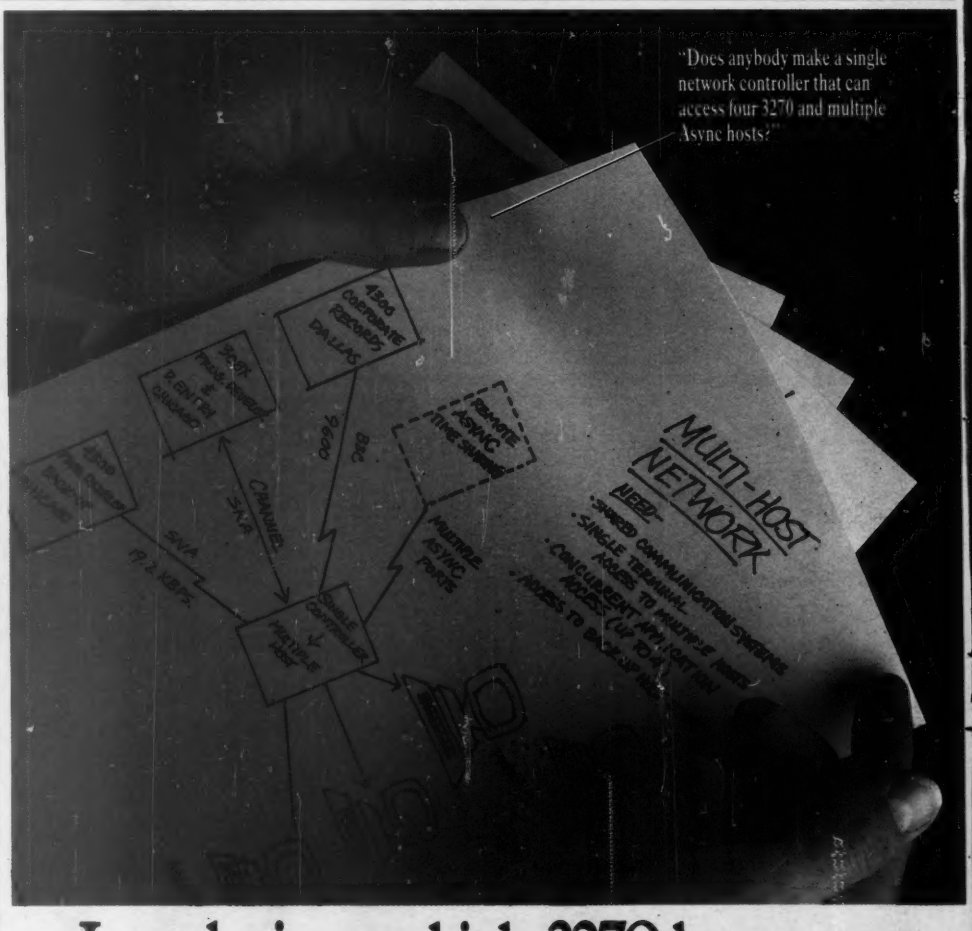
Applications written in RM/Cobol are source-code-compatible with RM/Cobol-8X.

The RM/Cobol-8X full development system is priced at $1,250. Versions for the IBM PC Network cost $1,500, and runtime systems are priced at $300 and $600.

Ryan-McFarland, Rolling Hills Estates, 609 Deep Valley Drive, Calif. 90274.

Software data base management systems

A shareware version of **Instant Recall**, **Precept's** memory-resident data base for the IBM Personal Computer said to allow free-form entry and retrieval, is now available.



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Lee Data's "single system" approach to multiple host access is your passport to less

Instant Recall indexes every word, so data is not restricted to predefined categories. Users can move data back and forth between Instant Recall and already running programs.

The shareware version is fully functional and handles up to an 80K-byte data base. It is available on Compuserve, Inc.'s Compuserve and bulletin-board systems or from the vendor for $10.

The expanded version handles 2M-bytes and includes a printed manual and telephone support. It costs $69.

Precept, Suite 173, 3790 El Camino Real, Palo Alto, Calif. 94306.

Software enhancements

Hemming Morse, Inc. has released **Focus: ABC Version 2A**, its audit and compilation software to be used with Lotus Development Corp.'s 1-2-3 Version 2.

Worksheets available in Version 2A include trial balance, tax adjustment, ratio graphs, summary trial balance, financial statements, tax forms summaries, adjustments and reclassifications, difference and ratio analyses and consolidations.

According to the vendor, the Audit Version 2A of Focus: ABC costs $495 for a single copy and $1,495 for a site license.

A single copy of Compilation Version 2A is $245. A site license costs $995.

Hemming Morse, 1700 S. El Camino, San Mateo, Calif. 94402.

■

Allen, Emerson & Franklin, Inc. has announced **Version 2** of the **GTP Development System** and the **GTP Professional Model** for the IBM Personal Computer with IBM PC-DOS 2 and Turbo Pascal 3.

GTP is an application generator for producing Turbo Pascal code for screen and data base systems.

Version 2 of the Development System includes the ability to create automatically multiple screen applications.

It also features a context-sensitive Help function, a new data base manager and global search criteria.

The GTP Professional Model reportedly includes all of Version 2 as well as a report generator and a menu generator.

According to the vendor, GTP Version 2 is priced at $150.

GTP Professional Model is priced at $200.

Allen, Emerson & Franklin, P.O. Box 928, Katy, Texas, 77492.

NBI, Inc. has introduced **IWS 4** software designed for its Integrated Workstation (IWS) electronic publishing system.

IWS 4 adds design graphics, equations, an alternate keyboard for scientific and mathematical characters and equations and spelling and print enhancements to current IWS functions.

Pricing for the IWS with 1.5M bytes of memory and 23M bytes of local storage begins at $11,990 and includes document composition software. Design graphics, equations and spelling are optional IWS 4 features, which are priced at $495 each.

NBI, P.O. Box 9001, Boulder, Colo. 80301.

■

Diagonal Data Corp. has enhanced its **Micro Maint** plant maintenance software package for microcomputers.

New features include enhanced labor costing and reporting and equipment identification. Also, Micro Maint now provides four categories of downtime reporting and allows the scheduling of plant maintenance work orders by operating hours as well as by days.

Micro Maint costs $4,950.

Diagonal Data, 2000 E. Edgewood Drive, Lakeland, Fla. 33803.

■

Digitalk, Inc. has introduced **Release 2 of Methods**, a Smalltalk programming environment for the IBM Personal Computer and compatibles.

The Methods communication interface permits any IBM or compatible PC to act as an intelligent terminal for a Unix computer via a standard RS-232 interface.

It can also be used to automate access to computer bulletin boards via a modem.

Another new feature, an IBM PC-DOS shell capability, permits the execution of PC-DOS commands or programs from within the Methods environment.

Release 2 of Methods is priced at $250.

Digitalk, 5200 W. Century Blvd., Los Angeles, Calif. 90045.

Communications

Universal Data Systems has announced **Sync-Up 201C** and **Sync-Up 208A/B** designed for micro-to-mainframe terminal emulation.

The modems fit in single slots in the IBM Personal Computer, Personal Computer XT and AT.

The Sync-Up 201C operates half duplex at 2,400 bit/sec. via the dial-up public switched telephone network (PSTN). The Sync-Up 208A/B provides two-wire half-duplex operation over the PSTN or four-wire full duplex private line operation at 4.8K bit/sec.

Two software packages are available for each modem: Sync-Up Dial, a synchronous automatic dialing communications package, and Sync-Up BSC, a package that allows IBM 2780, 3780 or 3270 Binary Synchronous Communications terminal emulation.

Sync-Up 201C costs $685 with Sync-Up Dial and $895 with Sync-Up BSC. Sync-Up 208A/B costs $1,200 with Sync-Up Dial and $1,410 with Sync-Up BSC.

Universal Data, 5000 Bradford Drive, Huntsville, Ala. 35805.

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NEW PRODUCTS/MICROCOMPUTERS

Server Technology, Inc. has announced **Com Port Board-6**, an add-in serial communications board said to allow users to interconnect up to six IBM Personal Computers, Personal Computer XTs or ATs using the vendor's Easylan local-area network.

The Com Port Board-6 is configured as a half card with an attached daughterboard and fits into a short slot.

It is based on the RS-232C interface standard and works in conjunction with the DOS-supported COM1 and COM2 ports. Three boards can be accommodated per PC, allowing up to 18 PCs to be interconnected within an Easylan network.

The six-port Com Port Board-6 costs $489.95.

Server Technology, Suite 107, 1095 E. Duane, Sunnyvale, Calif. 94086.

Data storage

Archive Corp. has introduced the **Super Scorpion** Model 5125L-1, a ¼-in. streaming cartridge tape drive for mini and microcomputer systems.

The drive has a capacity of 125M bytes and QIC-120 tape format compatibility.

Data is transferred at a rate of 90K bit/sec. with a tape speed of 72 in./sec.

According to Archive, the ¼-in. tape drive reads and writes any high-performance media cartridge that conforms to the industry ANSI format as well as any tape cartridge that conforms to the QIC-24 data format standard.

The Super Scorpion is priced at $733.

Archive, 1650 Sunflower Ave., Costa Mesa, Calif. 92626.

Extended Systems has announced **Sharedata**, a system said to allow up to four personal computers to concurrently share data on one external 20M-byte hard disk drive.

Sharedata operates as a multitasking storage controller. It can utilize standard RS-232 communications ports with transfer rates up to 19.2K bit/sec. An RS-422 interface is also available that transfers data up to 670K bit/sec.

Sharedata allows volume and file sharing with IBM PC-DOS or Microsoft Corp. MS-DOS. It also works with networks.

Sharedata includes an external package with a 20M-byte hard disk, multiported disk controller, disk driver, utility package, four 50-ft. cables and RS-232 adapters.

It costs $1,995.

Extended Systems, P.O. Box 4937, 6062 Morris Hill Lane, Boise, Idaho 83711.

■

Priam Corp. has introduced the **ID100-PC**, a 100M-byte internal disk add-in kit for the diskless IBM Personal Computer XT and compatible products.

The kit consists of a 103M-byte, 5¼-in. Winchester disk drive, controller, installation and utility software on floppy diskette and interface cables.

The disk drive is a Priam Model V185 5¼-in. disk drive with a controller using the run-length limited method of data encoding.

The ID100-PC is priced at $2,698.

Priam, 20 W. Montague Expwy., San Jose, Calif. 95134.

Printers/Plotters/Peripherals

Oasys, Inc. has introduced the **Laserpro Express** and the **Laserpro 1510** laser printers.

The Laserpro Express is an 8 page/min. printer.

It can control printer output so the page emerges with the printed side either up or down.

It features a 250-sheet paper cassette, a 100-sheet output capacity tray and a 50-sheet adjustable paper stacker.

According to the vendor, the Laserpro 1510 is a 15 page/min. printer designed for graphics and typographic applications.

It is said to print and stack up to 500 sheets at a time.

The Laserpro 1510 has a dual paper-feed system, prints at a resolution of 300 by 300 dot/in. and has 20 bit-mapped fonts.

The Laserpro Express costs $1,895, and the Laserpro 1510 costs $6,995.

Oasys, 8352 Clairemont Mesa Blvd., San Diego, Calif. 92111

■

Toshiba America, Inc. Information Systems Division has introduced the **P351C**, a color version of its 3-in-One 24-pin dot matrix printer.

Features include the ability to print overhead transparencies and emulate Qume Corp. Sprint 11 daisywheel and IBM color printers.

The P351C costs $1,749. Available free to purchasers is a start-up kit that includes Microsoft Corp.'s Chart, a color graphics software program, 25 transparency sheets, a software integration guide and enhancement catalog and color ribbon.

Toshiba America, 2441 Michelle Drive, Tustin, Calif. 92680

■

Lasergraphics, Inc. has added the **UI-100M24**, the **UI-100S15** and the **UI-100S20** rasterizing computers to its UI-100 series.

The UI-100M24 is for the Mitsubi-

Continued on page 140

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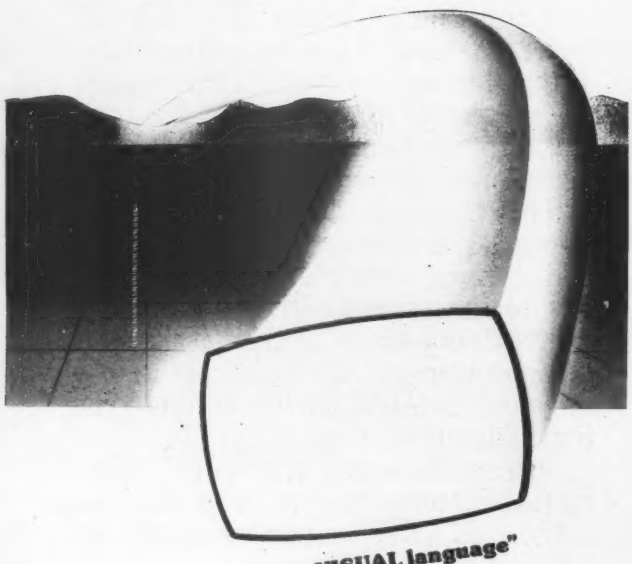

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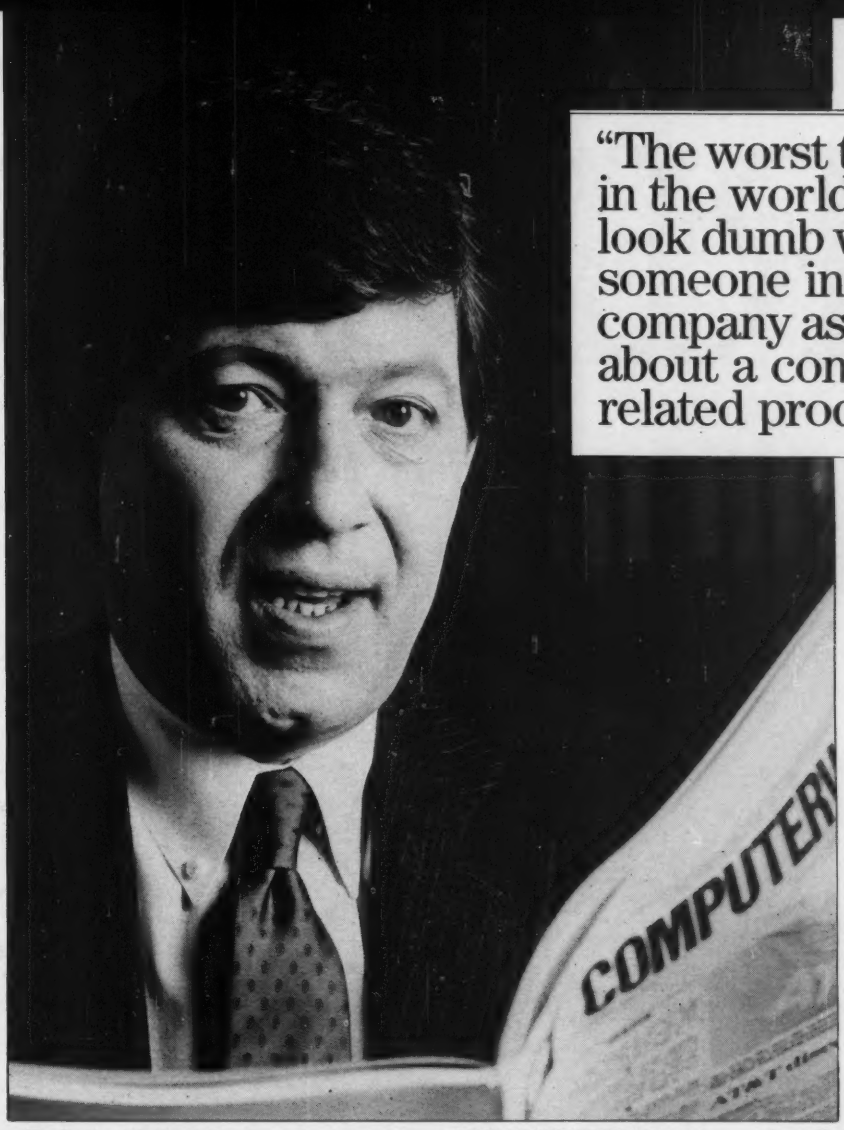

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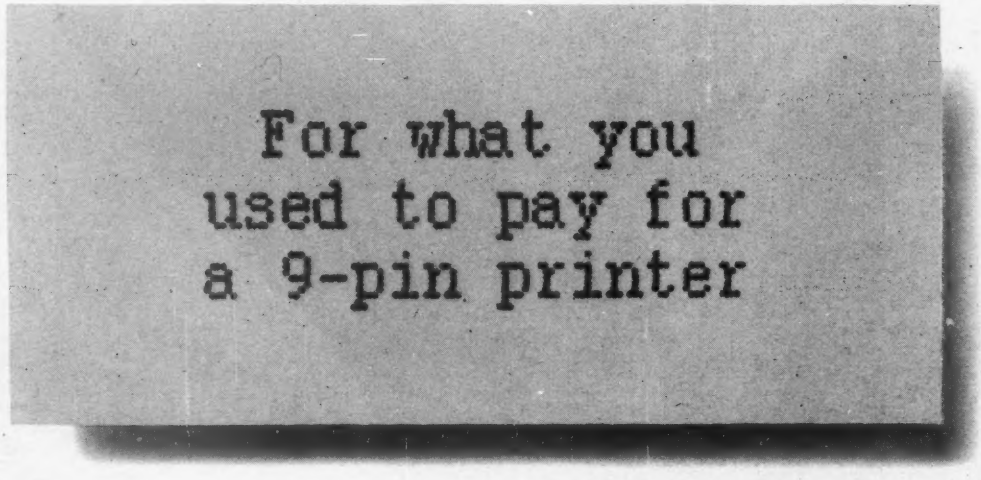

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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 136

shi Electronics America, Inc. G-500 color thermal transfer printer. The UI-100S15 and UI-100S20 are for the Seiko Instruments U.S.A., Inc. CH-5301 and CH-5312 color transfer printers. The products produce color and monochrome hard copy on roll stock paper and transparencies.

The UI-100M24 and the UI-100S20 cost $7,495 each. The UI-100S15 costs $4,495.

Lasergraphics, 17671 Cowan Ave., Irvine, Calif. 92714.

■

Alps America has announced the 18-pin **P2100** dot matrix printer.

The P2100 prints at 400 char./sec. in draft mode, 200 char./sec. for memo quality and 80 char./sec. for near-letter quality. It features a 4K-byte buffer expandable to 256K bytes and offers a resolution of 240 by 216 dot/in.

Other features include the ability to emulate both IBM and Epson America, Inc. character sets, interchangeable font cartridges and both push and pull tractor feeders.

The P2100 costs $1,595.

Alps America, 3553 N. First St., San Jose, Calif. 95134.

■

Ampex Corp. has announced its **Ampex 232** IBM Personal Computer AT-compatible terminal.

The Ampex 232 is an ASCII terminal, which can be configured through the host PC software to function in either single or multiuser Personal Computer, Personal Computer XT or AT environments. It can also act as a remote terminal.

The unit emulates the IBM PC scan codes, screen display and video attributes. Users have a choice of either a PC or a PC AT keyboard. Other features include a 25-line by 80- or 132-col. 14-in. green or amber display.

The Ampex 232 is priced at $649.

Ampex, 401 Broadway, Redwood City, Calif. 94063.

■

Summagraphics Corp. has introduced the **Microgrid II** series of computer graphics tablets.

The tablets are available in five active size areas: 17 in. by 14 in., 24 in. by 17 in., 20 in. by 20 in., 36 in. by 48 in. and 42 in. by 60 in.

All five models include power supply and offer options including four- or 16-button cursor and one-button or barrel stylus.

Prices for the Microgrid II series range from $2,585 to $5,085.

Summagraphics, 777 State St. Extension, Fairfield, Conn. 06430.

■

Datadesk International has announced that **Supermacro Keys**, a hardware-software combination including Datadesk's PC 8700 IBM Personal Computer AT-style keyboard and Borland International, Inc.'s Superkey, is now available for a variety of IBM Personal Computer-compatible computers. These include machines from AT&T, Compaq Computer Corp., Sperry Corp., NCR Corp., ITT, Tandy Corp., Corona Data Systems, Inc., Leading Edge Products, Inc. and the IBM family of personal computers.

The keyboard incorporates all features of the AT keyboard, including separate numeric keypad, status lights and extra-wide control and return. The software reportedly allows users to customize and automate software, streamline typing activity and protect files.

Supermacro Keys is priced from $129.95 to $149.95.

Datadesk International, Suite A, 7650 Haskell Ave., Van Nuys, Calif. 91406.

Board-level devices

Omnitronix, Inc. has announced a stand-alone Zilog, Inc. Z80-based **RS-232 micro controller**.

The board provides 8K bytes of erasable programmable read-only memory, one bank of dynamic random-access memory and two bidirectional asynchronous RS-232 serial ports. It comes with a wall power supply and is available either as a complete programmer's kit or customized for programming and development needs.

The programmer's kit costs $349. The technical programming pack is available separately for $14.95.

Omnitronix, P.O. Box 43, Mercer Island, Wash. 98040.

■

Maynard Electronics has announced **Surprise**, an accelerator board for IBM Personal Computers and Personal Computer XTs.

Surprise installs directly onto the system's motherboard. It can be toggled between fast and slow.

According to the vendor, Surprise accelerates the speed of IBM PC-DOS as well as the speed of the hardware. Surprise is priced at $249.

Maynard Electronic, 460 E. Semoran Blvd., Casselberry, Fla. 32707.

■

Votan has announced a **voice processing system** for IBM Personal Computers and compatibles said to provide speaker-independent recognition.

According to the vendor, the system can recognize voice commands from any user without training. It will recognize digits, "yes" and "no" and customized vocabularies.

The add-on card also provides continuous speech recognition in speaker-dependent mode as well as all voice functions over the telephone.

Speaker-independent recognition capabilities allow the system to accept voice responses from any type

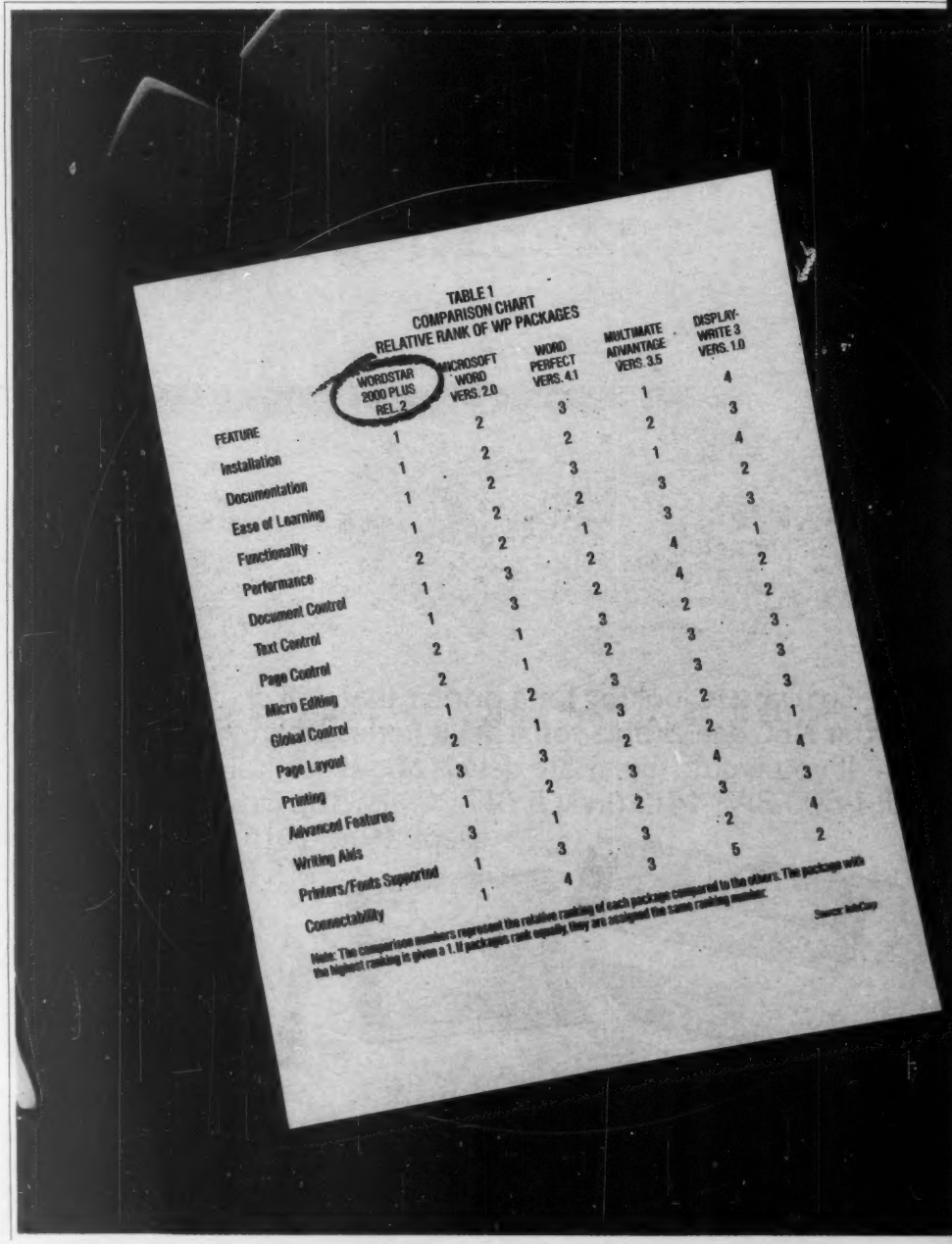

TABLE 1
COMPARISON CHART
RELATIVE RANK OF WP PACKAGES

FEATURE	WORDSTAR 2000 PLUS REL. 2	MICROSOFT WORD VERS. 2.0	WORD PERFECT VERS. 4.1	MULTIMATE ADVANTAGE VERS. 3.5	DISPLAY-WRITE 3 VERS. 1.0
Installation	1	2	3	1	4
Documentation	1	2	2	2	3
Ease of Learning	1	2	3	1	4
Functionality	1	2	2	3	3
Performance	2	2	1	4	1
Document Control	1	3	2	4	2
Text Control	1	3	2	2	2
Page Control	2	1	3	3	3
Micro Editing	2	1	2	3	3
Global Control	1	2	3	2	1
Page Layout	2	1	2	2	4
Printing	3	3	3	4	3
Advanced Features	1	2	2	3	4
Writing Aids	3	1	3	2	2
Printers/Fonts Supported	1	3	3	5	2
Connectability	1	4	3	3	3

Note: The comparison numbers represent the relative ranking of each package compared to the others. The package with the highest ranking is given a 1. If packages rank equally, they are assigned the same ranking number.

Source: InfoCorp

NEW PRODUCTS/MICROCOMPUTERS

of telephone.

The card is priced at $1,350. Without the speaker-independent recognition capability, it costs $1,200. Optional telephone interface costs $350.

Votan, 4487 Technology Drive, Fremont, Calif. 94538.

■

QDP Computer Systems, Inc. has announced the **Viva Card**, a high-resolution graphics card designed for use with the IBM Personal Computer XT and AT.

The Viva Silver Card provides a resolution of 640 by 400 pixels, 16 colors and 128K bytes of on-board video random-access memory (RAM) for use with an IBM color transistor-transistor logic, red-green-blue monitor.

The Viva Gold Card provides a resolution of 1,024 by 1,024 pixels, 16 colors and 512K bytes of on-board video RAM for use with ultrahigh-resolution monitors.

The Silver Card costs $1,295, and the Gold Card costs $2,295.

QDP Computer Systems, 10330 Brecksville Road, Cleveland, Ohio 44141.

■

Micro Way has announced the **Number Smasher/ECM**, an accelerator board for IBM Personal Computers and compatibles.

The board can hold up to 1M byte of random-access memory and an Intel Corp. 8087 coprocessor. It runs in two modes.

In the first, Microsoft Corp. MS-DOS and IBM PC-DOS can be booted with 512K bytes to 704K bytes of memory. Memory above 640K bytes can be turned on with switches.

In the second mode, optional Megaswitch MMU and Megabank software are used to configure the board so that 1M byte of memory is available for MS-DOS and PC-DOS applications.

Number Smasher/ECM costs $599. A 12-MHz 8087 coprocessor costs $250, and Megaswitch MMU costs $100.

Micro Way, P.O. Box 79, Kingston, Mass. 02364.

■

Micro Plus has announced the **Remote Workstation Plus**, an adapter card and software said to transform an IBM Personal Computer, Personal Computer XT or AT into a multisession 3270 Systems Network Architecture or Binary Synchronous Control remote workstation.

The card has an on-board Intel Corp. 80186 processor and 128K bytes of random-access memory that support up to eight host sessions, printer emulation and file transfer at the same time.

The Remote Workstation Plus is priced at $1,195.

Micro Plus, 3200 N. Federal Highway, Boca Raton, Fla. 33431.

■

AST Research, Inc. has announced the **Six Pac Premium** expanded memory board, said to be expandable to 2M bytes of random-access memory.

The board runs on the IBM Personal Computer and compatibles. It includes one serial port, with an optional second serial port; one parallel port; a battery clock and calendar; and optional game-adapter port.

The Six Pac Premium comes with the Desqview multitasking and windowing program from Quarterdeck Office Systems, Inc. of Santa Monica, Calif., and with AST's Super Pak utility software.

Six Pac Premium is priced from $595 to $1,445, depending on memory configuration.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

■

Quadram Corp. has introduced the **Quad EMS+** and the **Quad EMS+ I/O** expanded memory boards said to support both the Lotus/Intel/Microsoft Expanded Memory Specification (EMS) and Enhanced Expanded Memory Specification standards on IBM Personal Computer XTs and compatibles.

The Quad EMS+ supports both 64K- and 256K-byte dynamic random-access memory (RAM) chips. It can be stacked with up to 2M bytes of addressable memory. With 256K bytes, it costs $495.

The Quad EMS+ I/O is a multifunction version said to feature a bidirectional parallel port, an asynchronous serial port and a real-time clock/calendar with a battery backup.

The multifunction board has up to 2M bytes of addressable memory, with 1M byte on the main board and 1M byte on a daughterboard. A standard configuration with 256K-byte dynamic RAM retails for $545.

Quadram, One Meca Way, Norcross, Ga. 30093.

Services

Micro Support Resource Corp. has introduced the IBM PC-DOS **Cheatsheet** reference guide.

According to the vendor, the Cheatsheet contains simple-to-use, step-by-step instructions on how to use PC-DOS.

Information includes how to format a disk, copy or delete a file and maintain directories and subdirectories of files on a disk.

Other features include an introduction to the personal computer and its components and tips on ways to perform certain tasks on the microcomputer.

The Cheatsheet is priced at $15, the vendor said.

Micro Support Resource, Suite 150, 3355 Northeast Expwy., Atlanta, Ga. 30341.

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Introducing WordStar® 2000 Plus Release 2, the new and improved software that topped InfoCorp's chart of word processing packages.

We could make all kinds of claims about our new WordStar 2000 Plus Release 2.

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But we decided to let the experts do the talking.

In a comparative report—the report containing the chart to the left—Robert Lefkowits of InfoCorp said:

"WS 2000+ emerges as a clear winner in overall applicability. InfoCorp believes WS 2000+ would appeal to the largest number and widest variety of users. Its layered functionality, ease of learning, and excellent communications features make it ideal for corporate users, ranging from secretaries to clerks to managers to executives."

And, after reviewing WordStar 2000 Plus Release 2 alongside MultiMate™ Advantage™ and IBM® 's DisplayWrite® 3, International Data Corporation's Jim Chapman concluded:

"WordStar 2000 is our favorite—for ease of learning, ease of use...and for well-conceived and helpful documentation."

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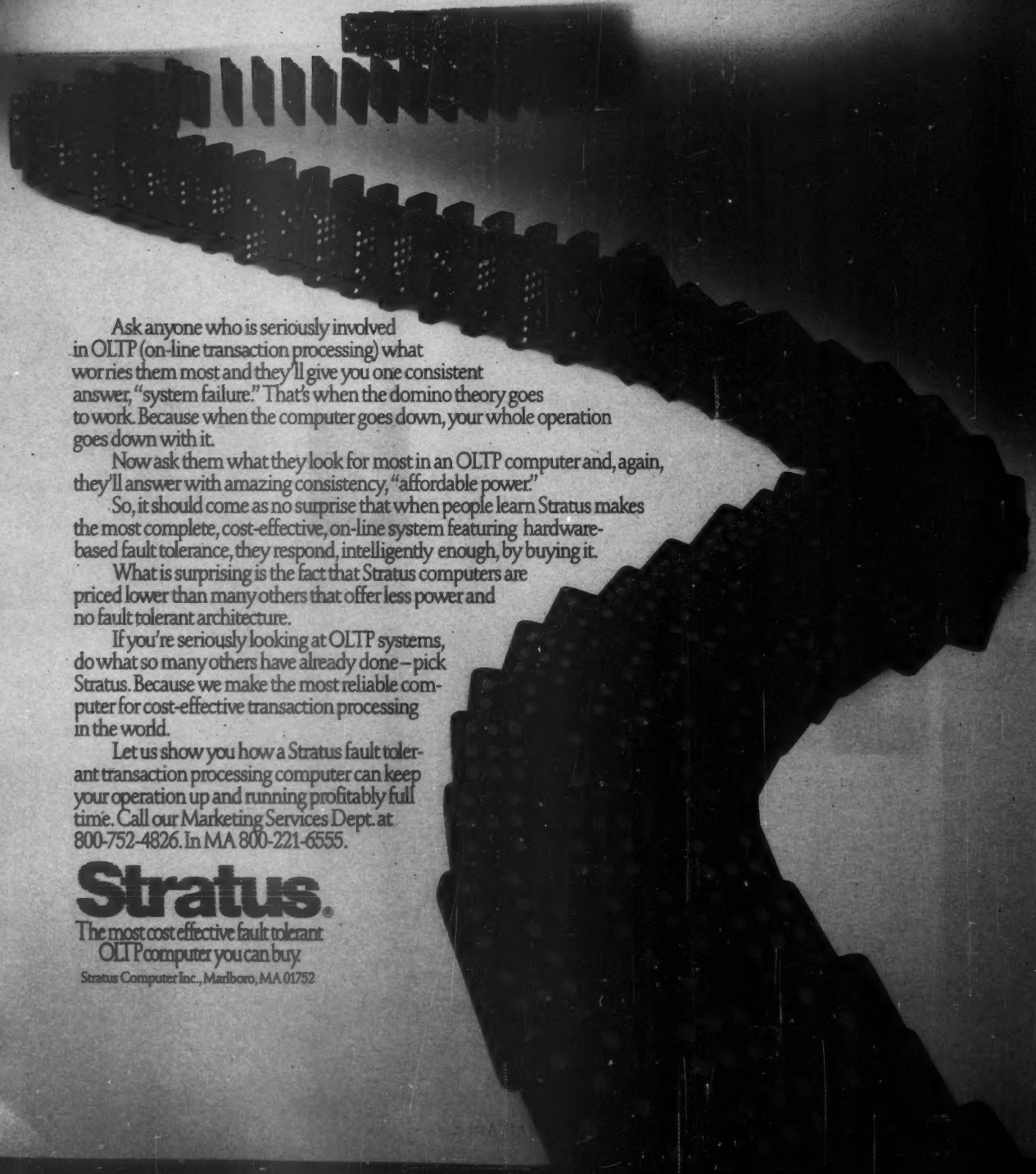
The case for fault tolerant transaction processing.



Ask anyone who is seriously involved in OLTP (on-line transaction processing) what worries them most and they'll give you one consistent answer, "system failure." That's when the domino theory goes to work. Because when the computer goes down, your whole operation goes down with it.

Now ask them what they look for most in an OLTP computer and, again, they'll answer with amazing consistency, "affordable power."

So, it should come as no surprise that when people learn Stratus makes the most complete, cost-effective, on-line system featuring hardware-based fault tolerance, they respond, intelligently enough, by buying it.

What is surprising is the fact that Stratus computers are priced lower than many others that offer less power and no fault tolerant architecture.

If you're seriously looking at OLTP systems, do what so many others have already done – pick Stratus. Because we make the most reliable computer for cost-effective transaction processing in the world.

Let us show you how a Stratus fault tolerant transaction processing computer can keep your operation up and running profitably full time. Call our Marketing Services Dept. at 800-752-4826. In MA 800-221-6555.

Stratus.

The most cost effective fault tolerant OLTP computer you can buy.

Stratus Computer Inc., Marlboro, MA 01752

Auxiliary equipment

Mandrill Corp. has announced **Coldblue**, a ventilation system for IBM Personal Computers and Personal Computer XTs.

The system is said to allow users of add-on boards, internal modems and internal hard disks to lower the operating temperature of the system. Coldblue features two side-by-side fans. It provides forced air ventilation directly into the card area.

Coldblue mounts inside the chassis and is powered directly from the computer power supply. It costs $185.

Mandrill, P.O. Box 33848, San Antonio, Texas 78265.

■

Microcomputer Accessories, Inc. has added the **Plotter Accessory Drawer**, the **Roll-out Printer Shelf**, the utility **Side Shelf** and the **Easel** to its Micromanager System of personal computer accessories.

The Plotter Accessory Drawer installs between Micromanager modules. It costs $79.95. The Roll-out Printer Shelf can also serve as a roll-out keyboard drawer. It costs $49.95.

The Side Shelf creates an extra desk, shelf and storage space. It costs $14.95. The Easel mounts in any front corner channel and revolves and tilts. It costs $29.95.

Microcomputer Accessories, P.O. Box 66911, 5405 Jandy Place, Los Angeles, Calif. 90066.

■

T. S. Microtech, Inc. has upgraded its **Dreamer** intelligent function keyboard for the IBM Personal Computer, Personal Computer XT and AT.

The Dreamer features a full 20-key numeric keypad with independent cursor controls and 30 keys programmed with over 580 commonly used commands from programs such as Lotus Development Corp.'s 1-2-3 Version 2 and Symphony and IBM's Displaywrite 3.

The Dreamer is priced at $259.

T. S. Microtech, 12565 Crenshaw Blvd., Hawthorne, Calif. 90250.

■

Ohm/Electronics has introduced the **Scooter** line of standby power supplies.

The line includes the Model SPS 250XT, the Model SPS 500XT and the Model SPS 500AT. The SPS 250XT, with 250W of backup power, and the SPS 500XT, with 500W of backup power, keep an IBM Personal Computer or Personal Computer XT, Apple Computer, Inc. Apple, Macintosh or compatible running under full load from 10 to 15 minutes after loss of primary power. The 500W SPS 500AT acts as a guard for safe emergency operation of an IBM Personal Computer AT or compatible.

The SPS 250XT is priced at $389.95. The SPS 500XT costs $689.95 and the SPS 500AT $729.95.

Ohm/Electronics, 746 Vermont St., Palatine, Ill. 60067.

■

Safe Power Systems, Inc. has introduced the **ESP 1000**, extended backup power system for personal computers and local-area networking and multiuser systems.

The system is said to provide up to an hour of battery power in the event of AC line failure. According to the vendor, it features less than one msec transfer time, visual and audible warning indicators, true sine-wave output and synchronized transfer from line to standby power.

The ESP 1000 costs $1,995.

Safe Power Systems, 528 W. 21st St., Tempe, Ariz. 85282.

COMMUNICATIONS

Controllers

Able Computer has introduced the **Able QDHU**, a communications controller for Digital Equipment Corp. Microvax II.

According to the vendor, the controller combines emulation of DEC DHV and DHU controllers on a single quad-size board. Interrupts are said to be reduced by a 64-bit silo on each output line and a 256-char. programmable silo display on input.

The board offers a 62K-bit aggregate throughput and auto flow control of both transmit and receive. It connects eight asynchronous lines to the DEC Q-bus and accommodates rates of 50 through 38.4K bit/sec. full duplex.

The Able QDHU costs 41,295.

Able Computer, 3080 Airway Ave., Costa Mesa, Calif. 92626.

■

Advanced Computer Communications has announced that its **ACP 5250** and **ACP 6250** Digital Equipment Corp. interfaces have been certified by the Defense Communications Agency as linking to the Defense Data Network at a rate of 64K bit/sec.

Both interfaces are single-board communications processors with on-board CCITT X.25 firmware. The ACP 5250 attaches to DEC's Microvax II, and the ACP 6250 attaches to the VAX computer line.

The ACP 5250 costs $4,200, and the ACP 6250 costs $6,490.

Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101.

■

Communications Analysis Corp. has announced the **Sentinel-232**, a private branch exchange data collection device.

The Sentinel-232 consists of an in-

Continued on page 144

Announcing

Computerworld's New MICRO DIRECT SHOPPER

An easy way for you to order micro products.

Now you can order microcomputer products directly from suppliers through Computerworld's new MICRO DIRECT SHOPPER.

Beginning with our May 26 issue, Computerworld's display classified section will include MICRO DIRECT SHOPPER, an all new section designed especially for companies that sell their micro products by mail or telephone orders.

This can mean a savings of money, time and energy in locating and acquiring the micro products that you need. MICRO DIRECT SHOPPER will appear preceeding the Buy-Sell-Swap section every week in Computerworld.

So be sure to watch for MICRO DIRECT SHOPPER starting May 26 in Computerworld. It's your ticket to truly convenient micro shopping. And it's now available in Computerworld.

COMPUTERWORLD

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NEW PRODUCTS/COMMUNICATIONS

Continued from page 143

tegrated ¼-in. tape drive and specially designed RS-232 interface controller. The controller receives data from the RS-232 output of any PBX, in any format, and ensures that the data, protocol and synchronization match the user's specifications. It then transmits to the tape drive for storage.

The tape drive will accept tape reels from 7 in. to 10½ in. using an automatic load feature.

The Sentinel-232 costs $7,500.

Communications Analysis, 100 Fountain St., Framingham, Mass. 01701.

■

Memorex Corp. has announced the **2274-2A**, a 32-port local cluster controller said to support both Systems Network Architecture (SNA) and non-SNA operating modes.

The controller attaches directly to a byte or block multiplexer selector channel of an IBM 370, 3030, 3080, 3090, 4300 or IBM-compatible CPU. It can also support IBM Personal Computers.

Features include a 5¼-in. floppy diskette drive, support for graphics, seven colors, APL and text programming languages. According to the vendor, additional features include extended highlighting, a light pen and operator entry assist and support for 17 keyboard configurations in 15 different languages.

The 2274-2A is priced at $17,000.

Memorex, San Tomas at Central Expwy., Santa Clara, Calif. 95052.

Standard Microsystems Corp. has announced the **COM9064**, a very large-scale integration controller for the IBM 3274 or 3276 for product-attach protocol.

The COM9064 is a single-chip device designed to implement the IBM 3270 Coax Type A protocol. It establishes the physical link between an IBM 3274 or 3276 controller and peripheral equipment. Each controller uses one mainframe I/O port and interconnects and distributes the data to up to 32 separate devices.

The half-duplex communication takes place at a 2.35-MHz data bit rate.

Pricing in quantities of 100 is $16.95 each.

Standard Microsystems, 35 Marcus Blvd., Hauppauge, N.Y. 11788.

Voice/data communications

Comdesign, Inc. has enhanced its **CX3000 Circuit Exchange** data private branch exchange to include full redundancy.

To provide redundancy, two complete sets of control and switching modules are included in each CX3000, leaving room for 17 asynchronous line cards, each supporting 24 channels.

According to the vendor, the redundant power supply is a hot-spare that is always on-line.

The CX3000 is priced from about $300 per line for a 48-line system to about $100 per line for a fully configured 408-channel unit.

Redundancy is included at no extra charge.

Comdesign, 751 S. Kellogg Ave., Goleta, Calif. 93117.

■

Voice Computer Technologies Corp. has introduced **PAT**, a private branch exchange automated attendant and messaging system for its turnkey voice response system product line, the VCT Series 2000.

PAT was designed to perform the functions of a switchboard operator and message center. It is able to route calls, take messages, screen calls and page parties not at their desks. PAT also provides automated attendant and voice/mail features.

The VCT Series 2000 can handle up to 32 simultaneous transactions with speech storage capacity of up to four 190M-byte disks, or 50 hours.

PAT is priced at $6,500.

Voice Computer Technologies, Suite 175, 5730 Oakbrook Pkwy., Norcross, Va. 30093.

■

Lightwave Communications, Inc. has introduced a **voice channel card** for its Multimux 1000 fiber-optic multiplexer.

The 300Hz to 3-kHz voice interface is available for toll-grade telephone communications. It comes with a standard AT&T RJ-11 socket for connecting a headset or telephone handset.

The voice channel is implemented using a digital continuously variable slope delta modulation device and transmits the digitized information down one of the 10 high-speed channels.

Each voice channel card costs $350.

Lightwave Communications, 650 Danbury Road, Ridgefield, Conn. 06877.

Software

Endeavors Group, Inc. has announced **Gangnet**, local-area networking software for Hewlett-Packard Co.'s Series 200 and 300 computer systems running under the Pascal operating system.

Gangnet is said to permit up to eight computers to share mass storage devices connected to the computers on a common dedicated HP-IB bus.

Two versions are available. One provides for the workstations to boot from the shared disk, and the other boots from the disks connected to the internal HP-IB, internal disks or HP's Shared Resource Manager.

The Gangnet software costs $895 per cluster of up to eight workstations.

Endeavors Group, P.O. Box 2923, Tulsa, Okla. 74101.

■

Harris Corp. has announced software for the local **Challenger** controller, designed to provide remote communications capability.

The Harris Challenger is an IBM 3270 interactive controller. It has the built-in hardware capability to oper-

Continued on page 148

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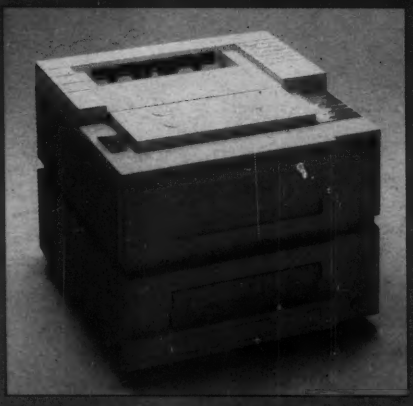

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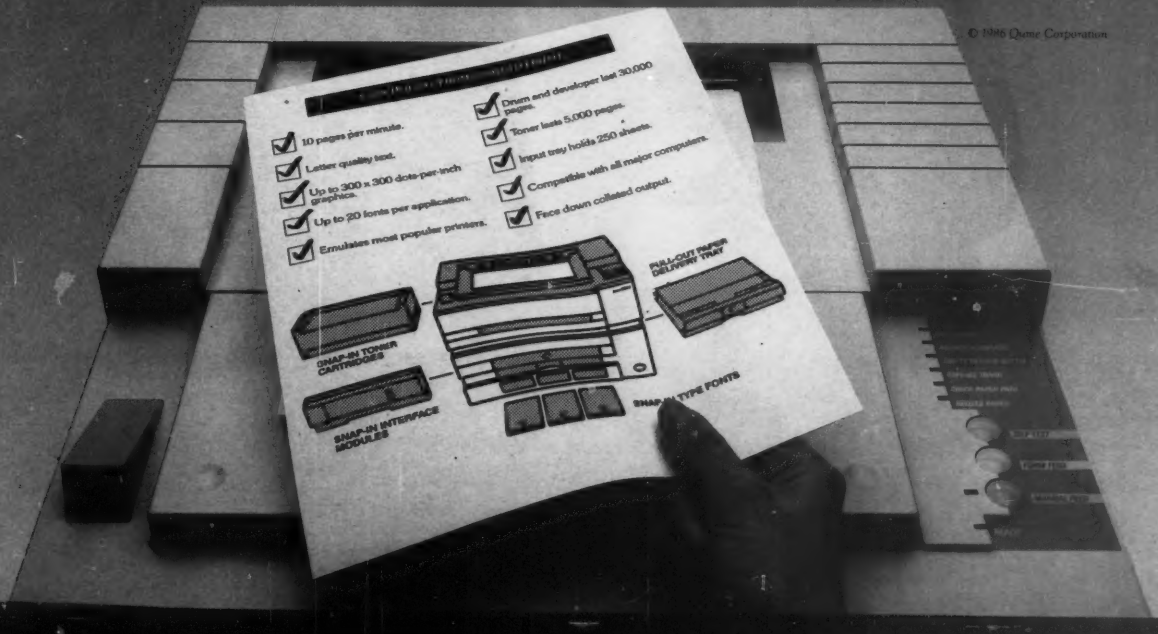


Someday, our children will be able to share information, anywhere, anytime and in any form as easily as we use the phone today. At Northern Telecom, we call this vision the Intelligent Universe,* and we're already building telecommunications products to make it a reality.

Recently, the global telecommunications industry established a set of standards called Integrated Services Digital Network, to help guide the future of telecommunications.

In concert with you our customer, we're fully committed to applying the principles of ISDN. After all, these principles are but another step on the way to our vision.

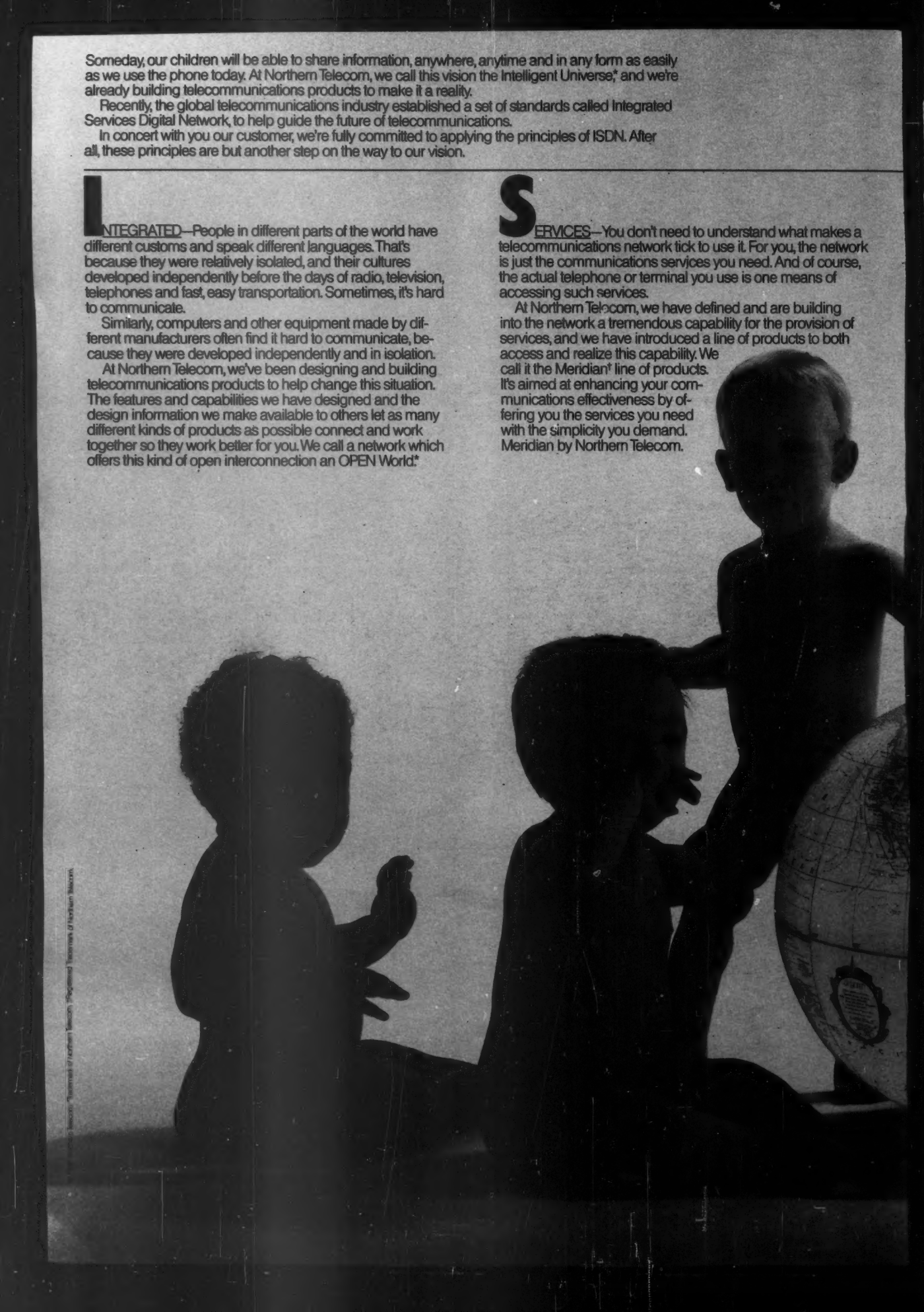
INTEGRATED—People in different parts of the world have different customs and speak different languages. That's because they were relatively isolated, and their cultures developed independently before the days of radio, television, telephones and fast, easy transportation. Sometimes, it's hard to communicate.

Similarly, computers and other equipment made by different manufacturers often find it hard to communicate, because they were developed independently and in isolation.

At Northern Telecom, we've been designing and building telecommunications products to help change this situation. The features and capabilities we have designed and the design information we make available to others let as many different kinds of products as possible connect and work together so they work better for you. We call a network which offers this kind of open interconnection an OPEN World.*

SERVICES—You don't need to understand what makes a telecommunications network tick to use it. For you, the network is just the communications services you need. And of course, the actual telephone or terminal you use is one means of accessing such services.

At Northern Telecom, we have defined and are building into the network a tremendous capability for the provision of services, and we have introduced a line of products to both access and realize this capability. We call it the Meridian† line of products. It's aimed at enhancing your communications effectiveness by offering you the services you need with the simplicity you demand. Meridian by Northern Telecom.



*Trademark of Northern Telecom. †Registered Trademark of Northern Telecom.

DIGITAL—Most people find that the best approach to solving a problem is the simplest approach. In telecommunications, the simplest way of carrying information is to convert it to a series of 1's and 0's—a digital bit stream.

A digital bit stream can mean anything—it can be your voice, a letter, a television picture, or the manufacturing diagrams for a new car.

At Northern Telecom, we've been designing and building telecommunications products based on the simple digital bit stream for two decades. We call a network that handles all information in digital form a Digital World.*

NETWORKS—In sports, a winning team starts with a good game plan, and adapts it in real time based on the changing flow of the game.

Up to now, telecommunications networks have followed a very static game plan. They were built mostly of separate elements to handle predictable changes in needs on a long-term basis. There was almost no way of controlling them in real time, so they provided little current information about overloads or breakdowns or anything.

At Northern Telecom, we have developed a new way of designing and controlling telecommunications networks. It's a game plan for public or private network architects who want to design and run their whole network like a winning team. It also lets networks carry different kinds of information more easily and economically and thereby provide the basis for supporting new services and capabilities for you.

We call it Dynamic Network Architecture.*

nt northern telecom

NETWORKING

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Directories List 46,000 DP Users

Each directory of computer installations lists 10,000-16,000 computer users covering the NY Metro Area (NY, NJ & CT), the Mid-Atlantic States (PA, VA, MD, DC, WV & DE), and the New England area (MA, ME, NH, RI & VT). Each site includes a profile of the hardware installed, software installed, (languages, databases, etc.), consultants used, future plans, applications and DP executives' names, titles, and phone numbers. An index provides quick access to 133 cross references by hardware, software and industry. Price: NY-$560, MA-$395, and NE-$395. Call (212) 683-0606. Computer Management Research, Inc. 20 Waterside Plaza, NY, NY 10010.

NEW PRODUCTS/COMMUNICATIONS

Continued from page 144

ate as a remote controller.

The software costs $695.

Harris, Lanier Business Products, 1700 Chantilly Drive N.E., Atlanta, Ga. 30324.

■

Systems Strategies, Inc. has announced **CX.25**, a portable data communications software package for connecting computer systems to packet-switched public nets.

CX.25 is said to be a full implementation of the CCITT X.25 protocol. In addition to allowing systems to interface with packet-switched networks, it permits high-speed data transfer by direct communication between data terminal equipment.

Written in C language, CX.25 costs $60,000 for an initial license plus an attached royalty schedule.

Systems Strategies, 225 W. 34th St., New York, N.Y. 10001.

Trax Softworks, Inc. has enhanced its **Terminal Simulation Facility** (TSF) said to allow IBM 3270 terminals to access ASCII-based public data bases, networks and electronic mail.

According to the vendor, TSF now allows users to scroll back and forth through up to 10 pages during an online session with a remote system.

TSF runs in a service virtual machine and requires the companion outboard communication processor Traxlink 1, plus an intelligent modem.

TSF can be leased for $4,000 per year.

Traxlink 1 is priced at $1,250.

Trax Softworks, 10801 National Blvd., Los Angeles, Calif. 90064.

Multiplexers/Modems

Anderson Jacobson, Inc. has announced the **AJ 1212-AD3H** IBM Personal Computer AT-compatible 1,200 bit/sec. modem.

The modem is said to feature a memory dialer, programmable software options, an extended PC AT command set, callback and answerback security and multilevel password security.

It is AT&T 212A/103 CCITT V.22 compatible and communicates over the switched telephone network at data rates up to 1,200 bit/sec.

It handles asynchronous or synchronous data, eight- through 11-bit char. via standard telephone jacks and cables.

The AJ 1212-AD3H costs $499.

Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

■

Emulex Corp. has introduced the **CS23** Digital Equipment Corp. DHU11-compatible communications multiplexer.

According to Emulex, the CS23 can handle up to 32 asynchronous lines.

It consists of a single hexadecimal-size controller board plus one or two distribution panels.

Each panel can be either a 12- or 16-line RS-232 panel, a 16-line RS-232/current loop panel or a 16-line RS-232/RS-422 panel.

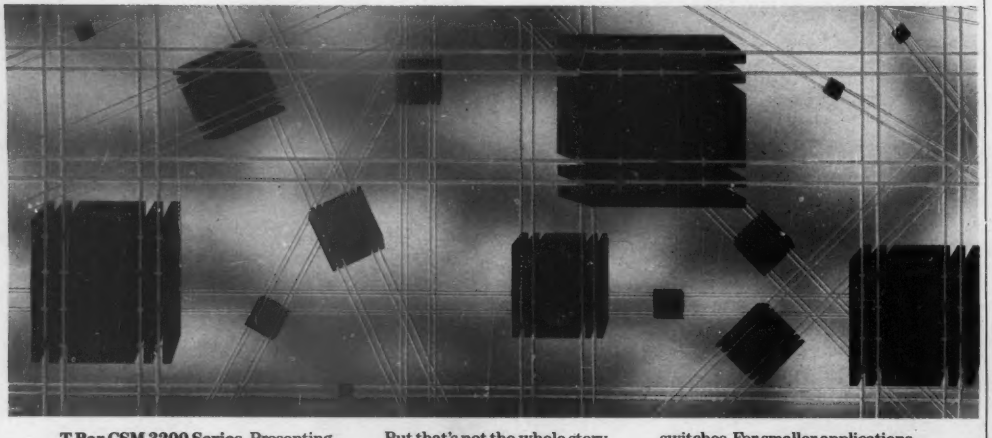
Features reportedly include DHU11 emulation, 50,000 char./sec. throughput and hardware-level flow control.

The product also has direct memory access operation on output and 256-word input first-in, first-out per 16 lines.

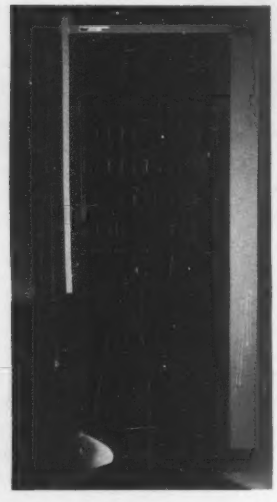
The CS23 is priced at $3,500 for a controller with 32 lines.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

T-Bar presents the only 32-channel switch ready for Sierra™ and Apache™.



T-Bar CSM 3200 Series. Presenting the CSM 3200 Series from T-Bar. Two advanced channel switching systems with one enormous advantage—the most capacity available anywhere. The 3200 Series is fully upgradable all the way up to 32x32 or 16x64.



But that's not the whole story. Designed to manage the data processing resources in a multiple IBM or Amdahl mainframe environment, the CSM 3200 Series also gives you more performance than any other channel switch.

The Fastest. The CSM 3200 Series uses T-Bar's revolutionary solid-state switching modules to provide the fastest through-path on the market. Only the CSM 3200 Series incorporates a "magic quadrant" with extremely small cable length, equivalent to less than 15 feet for those demanding applications.

The Smallest. In most matrix sizes, a CSM 3200 Series cabinet requires about half the space of previous channel switches.

The Safest. Unlike competitors' products, the CSM 3232 has eliminated the need for synchronous switching–eliminating the fear of bringing your system down.

All modules are a single cross-point and each can be replaced while your system is active—no system downtime.

The Most Flexible. The Least Expensive. The CSM 3200 Series costs less than competitive matrix switches. For smaller applications, we offer the economical CSM 3202.

Lowest Power Demand. The CSM 3200 Series comes with T-Bar's exclusive Power Saver circuitry, which reduces your operating power as much as 50%.

The Most Data Integrity. The 3200 Series' unique switching design eliminates parity errors, glitches or phantom channel hits. Also, it minimizes skew errors, to approximately 10 ns, with no measurable pulse width distortion, and it generates no switching noise.

For even more reasons why the CSM 3200 Series is like no other channel switch matrix, call (203) 834-8300 or write us at 141 Danbury Rd., P.O. Box T, Wilton, CT 06897.

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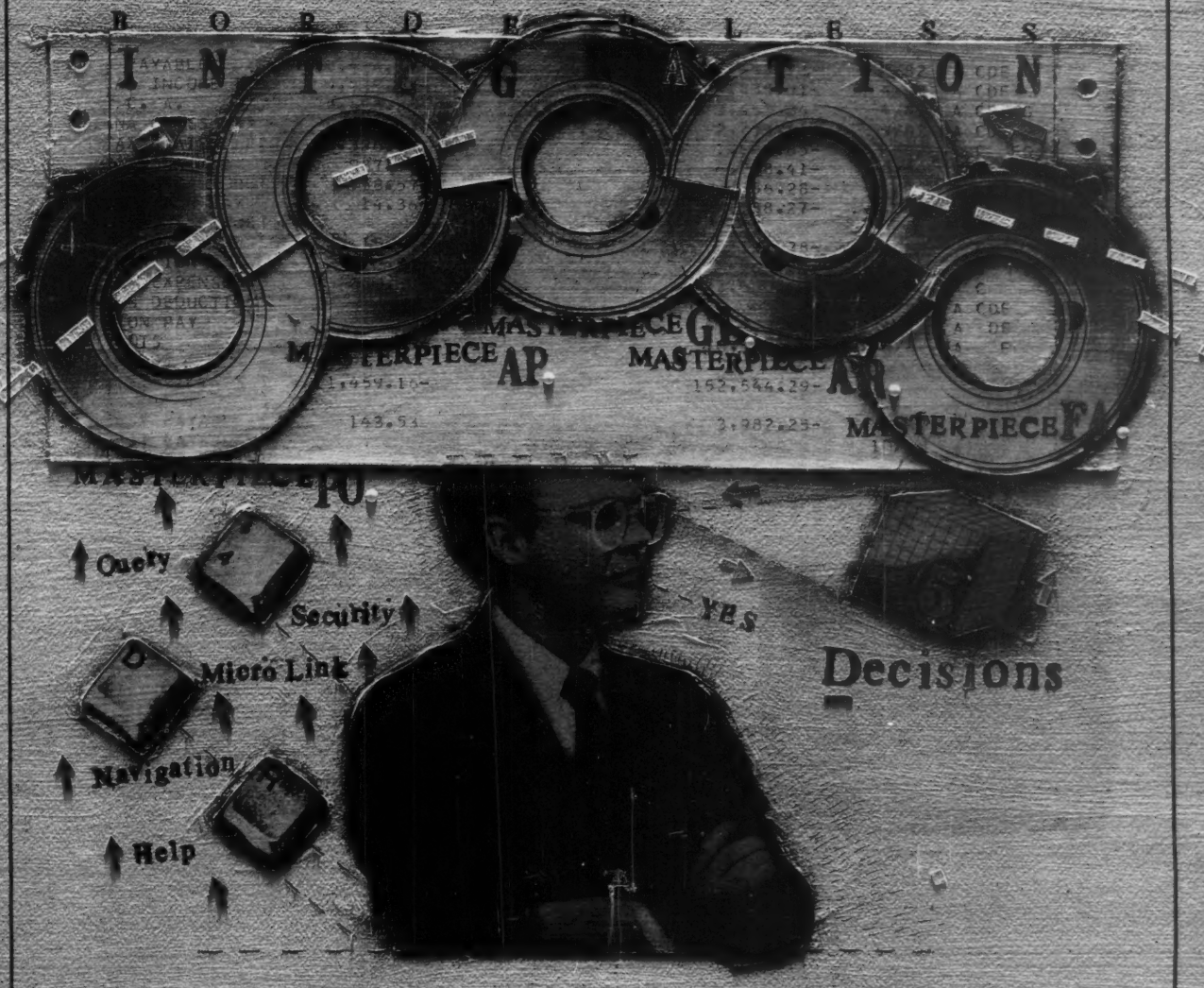

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NEW PRODUCTS/COMMUNICATIONS

Lightwave Communications, Inc. has introduced the **FO-232H** full-duplex modem, said to be plug compatible with RS-232 and CCITT V24/28 connectors.

According to the vendor, the FO-232H transmits data up to two kilometers at a rate of 19.2K bit/sec.

The unit draws power from EIA signals such as data terminal ready and can also accept 6V to 15V on pins 9 and 19.

The FO-232H modem costs $89.

Lightwave Communications, 650 Danbury Road, Ridgefield, Conn. 06877.

■

Emulex Corp. has introduced the Digital Equipment Corp. DHV11-compatible **CS04 multiplexer** designed to connect up to 64 asynchronous terminals to DEC's Microvax II.

Each line can run 38.4K bit/sec., and RS-422 devices can be located up to 4,000 ft from the host. The CS04 features asynchronous modem control, switch-selectable RS-232 and RS-422 interfaces, direct memory access on transmit operation and 256-word First In, First Out input. The board can accommodate either full-duplex or half-duplex modems.

The CS04 is priced from $3,000 for 16 lines to $10,500 for 64 lines.

Emulex, P.O. Box 6725, 3545 Harbor Blvd., Costa Mesa, Calif. 92626.

Local-area networks

Kimtron Corp. has introduced **K-Net**, an IBM Netbios-compatible local-area network.

K-Net is said to allow the user to run IBM PC Network and Token-Ring network software-compatible programs without modification.

According to the vendor, any multiuser application software written for use under IBM PC-DOS 3.1 will work with K-Net.

K-Net reportedly transfers data at 1M bit/sec. Up to 255 personal computers can be interconnected within a network.

K-net costs $395, including hardware and software.

Kimtron, Building 160, 1705 Junction Court, San Jose, Calif. 95112.

Network services

Dama Telecommunications Corp. has introduced **Damanet Dedicated Ring-Down**, a service said to provide full-period circuits to securities and related financial industries for dial-free voice applications among selected U.S. cities.

Three local-access arrangements to the Damanet wideband digital long-haul backbone network are available, including a microwave bypass technique.

The service features the company's Fail-Safe module, said to ensure call completion by detecting primary line failures and rerouting calls over the dial-up network.

The fixed monthly usage costs are currently as follows: Chicaco to New York, $525; Philadelphia to New York, $200; and San Francisco to New York, $900.

Dama Telecommunciations, 169 Johnson Road, Parsippany, N.J. 07054.

■

American Business Lists, Inc. has enhanced its **Instant Yellow Page** service.

The service allows users to dial in and retrieve business listings on-line from a data base of more than 10 million Yellow Page listings. More than 3,500 different Yellow Page categories are available.

According to the vendor, any personal computer or terminal with a modem can be used to access the Instant Yellow Page service.

Charges for the service are $1 per minute for connect time plus 10 cents per record printed. There is a subscription fee of $95 for the first year and $60 per year for renewals.

American Business Lists, P.O. Box 27347, Omaha, Neb. 68127.

SYSTEMS & PERIPHERALS

Processors

MDB Systems, Inc. has announced two **DR11-W** module configurations said to enhance the system performance of Digital Equipment Corp.'s Microvax II computers.

Both provide direct memory access transfer of 16-bit I/O data between the bus of the computer and an external device. One configuration has just the module supplied, and the other includes a cable cabinet kit.

According to the vendor, all user-developed applications software and peripherals utilized on larger VAX systems can be migrated directly to the Microvax II.

The MV-DR11-W costs $1,100, and the cabinet version, MV-F-DR11-W, costs $1,300.

MDB Systems, 1995 N. Batvia St., Orange, Calif. 92665.

■

Indocomp, Inc. has announced an **industrial computer system** complete with analog, digital and pulse I/O interfaces.

The system consists of an IND-68041 16- or 32-bit single-board computer housed in an IND-68102 dual-processor chassis.

It includes an interactive software package designed to assist engineers in developing prototype evaluation systems for machine control, data acquisition and process monitoring.

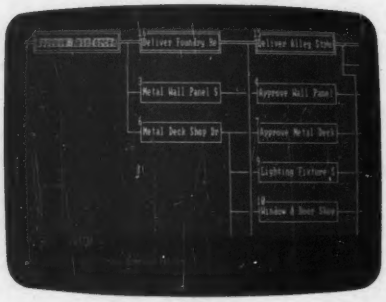
Features include 16 analog inputs, two analog outputs, two optical encoder inputs, 40 bidirectional digital I/O points and two counter timers.

The starter system costs $3,826.

Indocomp, 5409 Perry Drive, Drayton Plains, Mich. 48020.

You do the easy chart. We'll do the hard chart.

GANTT: The easy chart.



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Hand us the makings of a simple Gantt chart and watch Microsoft® Project Version 2.0 effortlessly create the corresponding PERT chart.

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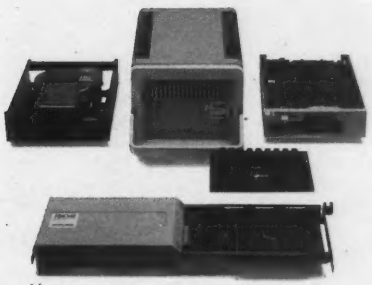

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INTRODUCING

CCA'S NEW WARP TEN BREAKS THE DOS BACKLOG BARRIER.

Attack your DOS backlog at warp speed. Tremendously productive power can now be integrated into your DOS shop at a tremendously low cost.

It's Computer Corporation of America's new WARP TEN program. An applications development system that will at least quadruple the speed with which you can respond to your users' needs.

And, it costs significantly less than more expensive software packages that are a lot less powerful. In fact, CCA's WARP TEN is going to change applications development programmers' entire perception of just what they can do under DOS.

With WARP TEN, you can be developing applications while the system is also managing production processing.

WARP TEN will run under CICS, but will also perform as a powerful stand-alone system. So processing time is decreased and system resources are saved for added capacity. And its truly fourth generation language means programmers spend time creating solutions. Not recreating drudge work.

At CCA, we're so confident that WARP TEN answers your need to increase productivity and cut through your backlog that we have an offer that doesn't cost you a thing, except a little time.

Call us, and we'll send a technical representative to install the WARP TEN right in your office. Then the entire day is yours to spend watching our representative actually build an application on your system.

You'll invest a day. But the payoff can be free weekends, with a disappearing programming backlog. Because nothing on the market approaches the productivity of WARP TEN, or the price.

Experience ultimate DOS power that can break through the backlog barrier. WARP TEN from CCA. Call 1-800-COS-WARP and ask for the "DOS Shop." Or, write John Donnelly, V.P. Marketing, Computer Corporation of America, Four Cambridge Center, Cambridge, MA 02142.

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NEW PRODUCTS/SYSTEMS & PERIPHERALS

National Semiconductor Corp. has introduced the **Series 32000 Designer Kits**, providing the key components needed to build a personal 32-bit, single-board computer.

One kit is based on the vendor's NS32016 microprocessor CPU and one on the NS32032 CPU. They provide the complete computing cluster chip set including CPU, memory management unit, floating-point unit, timing and control unit and interrupt control unit as well as firmware, manuals, application notes and a data book.

The NS32016 kit costs $59, and the NS32032 costs $75.

National Semiconductor, P.O. Box 58090, 2900 Semiconductor Drive, Santa Clara, Calif. 95052.

Data storage

The **MV-DK11-RM** disk controller for Digital Equipment Corp.'s Microvax II has bowed from **MDB Systems, Inc.**

The quad-size, high-speed storage module device disk controller provides data transfer rates from 1.2M to 2.5M bit/sec. It can support two physical drives at one or two logical units per drive.

Disk drive sizes can be from 67M bytes to more than 6G bytes formatted.

DEC-compatible 32-bit error correction code combined with 16-bit cyclic redundancy check are used to generate and check for media defect flagging and header errors.

The MV-DK11-RM costs $2,400.

MDB Systems, 1995 N. Batavia St., Orange, Calif. 92665.

■

North Atlantic Industries, Inc. has added the **Roadrunner II** for backup of hard disks to its line of tape drives.

Roadrunner II is said to combine 125M-byte storage capacity and an intelligent tape formatter in a single, half-height package. Two versions are available: one with a QIC-02 interface and one with an small systems computer interface (SCSI) port.

The device can read and write on the QIC-format, and it can read the QIC-24 format.

Roadrunner II costs $775 for the QIC-02 interface version and $995 for the SCSI interface version.

North Atlantic Industries, 60 Plant Ave., Hauppauge, N.Y. 11788.

Terminals

Conrac Division of Conrac Corp. has introduced the **Model 7064** 14-in., 23-MHz video color monitor.

The monitor is compatible with both the IBM Enhanced Graphics Adapter (EGA) card and the IBM Color Graphics Adapter (CGA) card.

With the CGA card, the monitor can display 16 colors with a resolution of 640 by 200 pixels. With the EGA card, the monitor can display 16 colors out of a palette of 64.

The Model 7064 is priced at $735.

Conrac, 600 N. Rimsdale Ave., Covina, Calif. 91722.

■

Intermec Corp. has introduced the **9570 Wedge Reader** for users of IBM terminals and Personal Computers.

According to Intermec, the 9570 emulates manual data entry. It was designed around a 16-bit microprocessor and is able to decode and automatically discriminate among the major symbologies.

The 9570 features two input ports.

The 9570 Wedge Reader is priced at $495, including cable.

Intermec, P.O. Box 36062, 4405 Russell Road, Lynwood, Wash. 98046.

■

Ampex Corp. has introduced the **Ampex 210 Plus** and the **Ampex 230 Plus** terminals.

The 210 Plus is said to offer 132 columns and 14 programmable function keys along with 400 bytes of nonvolatile memory. It features a total of 17 resident emulations as well as a 14-in. CRT, bidirectional printer port and seven resident national character sets.

The 230 Plus offers four 80-column display pages and 6K bytes of nonvolatile memory available to 16 programmable function keys. Other features include programmable editing keys and video attributes.

The 210 Plus costs $469, and the 230 Plus costs $569.

Ampex, 401 Broadway, Redwood City, Calif. 94063.

Printers/plotters

Soltec Corp. has introduced its **6400 series X-Y Recorders**.

The recorders are said to offer high-speed, high-acceleration pen response. They are available in four versions, two DIN A4 X-Y, one DIN A3 X-Y and DIN A3 X-Y-Y. All models feature built-in time base, electronic limiter and remote control functions.

The series offers writing speeds up to 1,500 mm/sec. (X-axis) and 2,000 mm/sec. (Y-axis).

The 6400 series X-Y Recorders are priced from $1,795.

Soltec, 11684 Pendleton St., Sun Valley, Calif. 91352.

■

King Engineering Co. has announced **Model 401 Formstacker**, designed to handle the output of a

Continued on page 154

5 Ways to Effortlessly Create or Edit Test Data

Without using DLTØ, IDCAMS, IEBGENER, or quick & dirty programs.

When you need IMS or VSAM test data under TSO/ISPF...

1. Edit IMS segments on-line in their hierarchical sequence using IMS-XPERT.
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Please send me:
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Continued from page 153

printer running at a rate of up to 2,000 line/min.

All continuous fanfold forms, including 11-lb, single-part paper, are stacked automatically.

It is compatible with high-speed computer printers including those from Data Products Corp., Harris Corp. and the Hewlett-Packard Co. 2500 and 2600 series.

Model 401 Formstacker is priced at $2,175.

King Engineering, 1733 Rancho St., Encino, Calif. 91316.

■

Memorex Corp. has announced the **Memorex 2114-1** dot matrix printer for IBM 3270 users.

The Memorex 2114-1 offers draft-quality printing at 220 char./sec., internal-correspondence quality at 110 char./sec. and near-letter-quality printing at 55 char./sec. It features a choice of font styles and a selection of 21 language sets.

The printer operates in both Binary Synchronous Communications and Synchronous Data Link Control environments.

The 2114-1 is priced at $3,600.

Memorex, San Tomas at Central Expwy., Santa Clara, Calif. 95052.

■

Infoscribe, Inc. has unveiled its **Model 1400** serial dot matrix printer.

The Model 1400 features an 18-wire print head. It offers draft-print quality at 400 char./sec., correspondence quality at 200 char./sec. and near-letter quality at 80 char./sec. It also provides 72 by 72 and 144 by 144 dot/in. resolution for graphics printing.

Other features include IBM, Epson America, Inc. and Diablo Systems, Inc. 630 interface emulations.

The Model 1400 printer costs $1,845.

Infoscribe, 1808 Michael Faraday Court, Reston, Va. 22090.

Power supplies

Nationwide Electronic Systems, Inc. has added 56 meters to its **Slimline** family of power measurement panel meters.

According to the vendor, both instantaneous power and total power can be monitored. The meters allow single or three-phase measurement. Display-only, binary-coded decimal outputs or RS-232, RS-422 or 20/60 mA versions are available.

The meters reportedly offer 0.2% accuracy, and the data may be fed to anything from programmable controllers to mainframe computers.

Prices for the meters range from $295 to $475.

Nationwide Electronic Systems, 3003 Wakefield Drive, Carpentersville, Ill. 60110.

■

The Dickson Co. has announced the **Dickson Temperature/Humidity meter**, a hand-held meter said to give instant temperature and humidity readings.

The LCD readout displays temperatures from 32° F to 160° F. Both the temperature and humidity sensors are contained within a pencil-size probe that connects to the instrument via a 3-ft coiled cord.

The Dickson Temperature/Humidity meter is priced at $495.

Dickson, 930 S. Westwood Drive, Addison, Ill. 60101.

Components

Zoltech Corp. has introduced the **VV-11** series of VME system chassis.

The series consists of three standard-size chassis. The VV-11 chassis is intended for integrated VME systems.

The smaller VCV-11 chassis is intended for mass-storage subsystems or card-cage-only requirements.

For very large system configurations, the VLV-11 chassis allows twice the card-cage and mass-storage capacity of the VV-11.

All the VV-11 series chassis can be mounted in a standard 19-in. rack.

According to the vendor, the chassis can be configured in a variety of ways.

All boards and drives are available from Zoltech.

Prices range from $675 to $3,500.

Zoltech, 7023 Valjean Ave., Van Nuys, Calif. 91406.

Auxiliary equipment

Business Security Systems Corp. has announced **Technalock**, a device for securing movable equipment.

Pressure-sensitive adhesive reportedly bonds a securing plate to the equipment. A flexible vinyl-coated steel cable and a lock are also part of the system.

Technalock can be installed at the rear of equipment and desks.

According to Business Security Systems, it takes about 400 lb to dislodge the plates.

The master system is priced at $24.95. Expansion kits are available.

Business Security Systems, 512 S. Hanley, St. Louis, Mo. 63105.

PRICE REDUCTIONS

Astrocom Corp. has reduced the price of its **Squeezipair** units.

Squeezipair is said to enable users to add a terminal or printer to an existing coaxial cable system.

According to the vendor, it also enables two terminals or printers to operate over one RG62A/U coaxial cable.

The Squeezipair works in pairs, one on the controller side and one on the terminal side. It reportedly operates with IBM 3270 Controllers.

The reduced price for Squeezipair is $75 each.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55107.

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NEWS

WORLD DIGEST
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LONDON — British Telecom (BT), Britain's major telecommunications services provider, has dissolved its marketing arm on the eve of further allegations of incompetence and improper activities. British Telecom Enterprises (BTE) is to be split up and folded back into BT, as it was in the days before BT was privatized.

BTE has been plagued by controversy since its inception shortly after BT's privatization in December 1984. BT has been repeatedly accused of abusing its dominant position in the supply of equipment to users.

LONDON — Many UK computer users are only days away from breaking the law as the deadline approaches for registrations under the Data Protection Act. Those who fail to register before May 11 computers that contain personal information on individuals face prosecution and unlimited fines.

But many computer users are still unaware that the act applies to them. One said, "I didn't know I was affected until recently, and that was only through someone mentioning it in conversation. I don't think it's been publicized enough."

PARIS — French and German scientists met last week to lay the groundwork for a European research center for scientific computing. The project's dual objectives are to expand research in parallel processing and to provide European researchers and engineers with advanced training in scientific computing.

The idea to create a European computing center that incorporates both academic and industry researchers was born in 1983.

Called CERFACS (the French acronym for European Center of Research and Advanced Training in Scientific Computing), the project received official backing from the French government in early February 1985.

The meeting represents the first step toward the internationalization of the project.

AMSTERDAM — The Electronic Mail Association (EMA) will meet with European electronic mail vendors at this month's Eurocom conference in an effort to expand its activities internationally.

Michael Cavanagh, director of the Washington, D.C.-based association, said the meeting has been arranged to gauge vendor interest in creating a European chapter of EMA.

Cavanagh said the creation of a European arm of the vendor-sponsored EMA would increase the flow of information about electronic mail technology between North America and Europe. Several prominent European vendors already participate in the U.S. electronic mail organization.

CANBERRA, Australia — Australia needs a national program to convert expert systems research findings into commercial products, said a recent Australian government report. "Australians have an internationally recognized strength in expert systems research and development," but that expertise is largely academic, and academics are often not equipped to commercialize their work, the report said. Private sector commercialization of expert systems has been too slow, the report concluded.

TOKYO — Computer Software Organization, Ltd. (CSO), a Japanese software dealer start-up, has purchased a 50% stake in California-based Foothill Research, Inc. (FRI).

In so doing, CSO acquired exclusive rights to sell FRI's Style G-4 programming language in the Pacific region.

Specific terms of the deal, however, were not disclosed. According to CSO officials, the company hopes the acquisition will help narrow technology gaps with U.S. software vendors. CSO is considering rewriting Foothill's Style in Japanese.

According to CSO, Style is 10 to 20 times more powerful than existing third-generation languages such as Fortran and Cobol.

See **DIGEST** page 156

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DEC, VAX, PDP-11 are trademarks of Digital Equipment Corporation. CDC is a trademark of Control Data Corporation.

DIGEST from page 155

MUNICH — West German data base vendors are buckling under pressure from IBM's DB2, a data base management system launched in early June 1983. Most data base vendors in West Germany say they are stepping up their R&D in an attempt to remain competitive with Big Blue.

Klaus Amann, general manager of West German software house Uccel GmbH, predicted the number of users running non-IBM software will continue to decrease.

Furthermore, if IBM enhances its existing product, other vendors' sales will drastically fall, he noted. Amann expects hard times for independent software houses vis-a-vis IBM's resolve to succeed in the data base market.

TOKYO — Claiming that it holds the patent on a type of flexible manufacturing system, London-based Morins PLC has demanded that some 20 Japanese flexible manufacturing system vendors pay $100,000 for each such system they ship to the U.S. Morins is also seeking a 2% royalty on any flexible manufacturing system sold to the U.S. by the Japanese.

In addition, Morins wants to be paid either $150,000 or 2% of the selling price for any Japanese flexible manufacturing system already purchased or delivered to a U.S. user, said a spokesman for the 111-member Japan Machine Tool Builders' Association. Morins wants a response from the Japanese by the end of June.

BRUSSELS — The Commission of the European Community is urging its 12 member nations to standardize and modernize their national telecommunications networks to enable the creation of a Pan-European integrated services digital network (ISDN). The commission also strongly recommended the members of the European Community adopt a common interface for connecting terminals to their national telecommunication networks.

In Europe, where the ISDN market is estimated to be worth $198 billion, European Community officials argue that a consensus must be developed for joint telecommunications services so those services can begin operation before 1993.

Those services could give telephone users features including automatic redialing of busy lines and memory for storing numbers, as well as a rapid telecopier that sends one four-page document per second and a teletex system that is 10 times faster than conventional telex.

COLOGNE, West Germany — The West German telecommunications industry is suffering from a dearth of qualified personnel, according to sources here.

The number of engineers graduating from the country's universities is too low to fill the industry's staffing needs, which are estimated at about 2,000 communications engineers. Last year, not even half the number of open engineering positions were filled. At present, the state-run postal and telecommunications authority has a large number of open slots for qualified engineers needed to handle critical research and development projects.

EAST BERLIN — Plans to increase the use of computers in East German manufacturing facilities and intentions of expanding trade relations with Western Europe were unveiled by Erich Honnecker, chairman of the East German Communist Party.

Speaking to the party's 11th annual convention, Honnecker said the use of computers in East Germany's state-owned production plants will be greatly expanded during the next five-year economic plan, which extends from 1986 to 1990.

Instead of the 28,000 computer-aided workstations originally planned for, up to 90,000 systems should be installed by 1990, Honnecker declared. The accelerated expansion of computer-aided manufacturing is expected to improve productivity by 100%, he added.

WEST BERLIN — The West German anticartel office, the Bundeskartellamt, has agreed to consider a complaint brought by Eclat, the European association of third-party lessors, against IBM. Eclat alleges that IBM has misused its dominant position in the computer market.

The complaint was lodged last October after individual discussions with IBM failed to gain concessions.

TOKYO — A panel of experts at the Japanese Ministry of Education has urged that enrollment limits be doubled in computer software-related departments at Japanese universities and colleges by 1992. The panel hopes to ensure that more systems engineers and software specialists are trained in order to offset the shortage of Japanese programmers. An estimated 600,000 additional programmers will be needed by 1990, the panel projected.

OSAKA, Japan — The semiconductor manufacturing subsidiary of Britain's Thorn EMI PLC is seeking financial aid from Japan's Matsushita Electric Industrial Co. in an apparent effort to fund research & development associated with its Transputer personal computer. According to Matsushita, a decision has not been reached on the proposal.

The unofficial request from Thorn EMI's Inmos subsidiary was made when a top Inmos manager visited Matsushita headquarters, according to Naomi Haga, an official at Matsushita Electric Trading Co., Matsushita's export and import arm.

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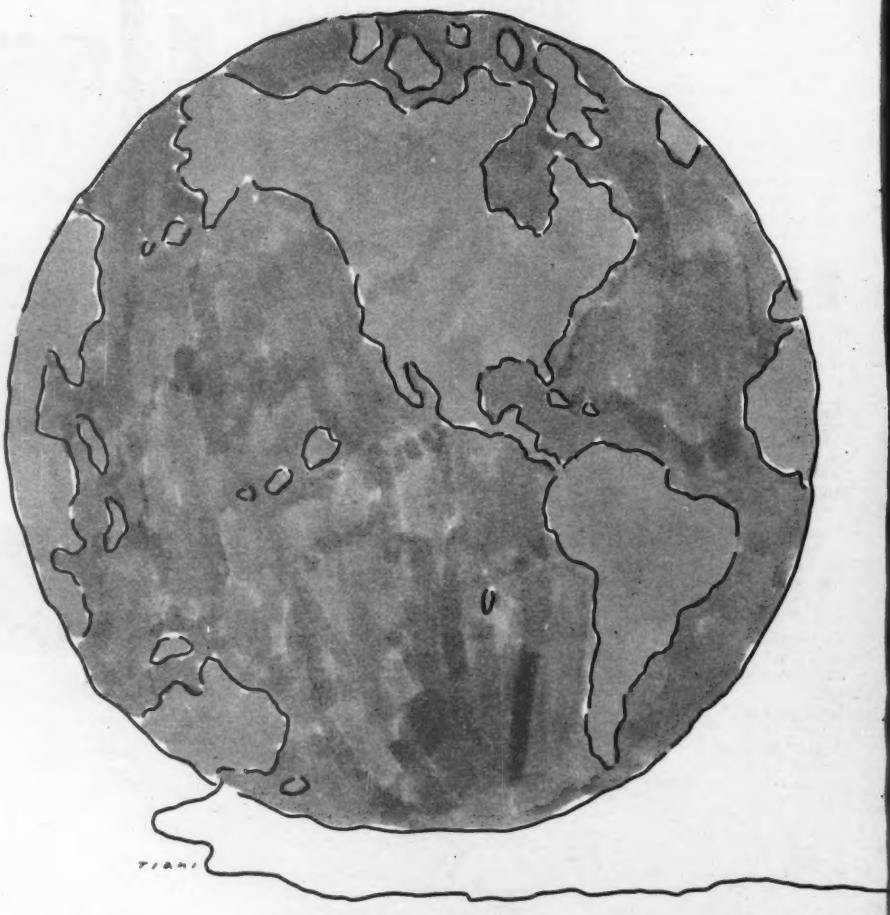

CALENDAR

WEEK OF MAY 18

MAY 19, ANNAPOLIS, MD. — **Mapics Users' Conference.** Contact: Salem Corp., 1654 Poplar Lane, Annapolis, Md. 21401.

MAY 19-21, HILTON HEAD, S.C. — **Audit Managers Symposium VII.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

MAY 19-21, SAN FRANCISCO — **Hammer Forum West: Change and Continuity in End-User Computing.** Contact: Michael Hammer, Hammer and Co., Five Cambridge Center, Cambridge, Mass. 02142.

MAY 19-21, SAN FRANCISCO — **ID Expo, The Conference and Exposition of Automatic Identification Systems and Keyless Data Entry.** Contact: Expocon Management Associates, 3695 Post Road, Southport, Conn. 06490.

MAY 19-22, PHILADELPHIA — **Lasers in Manufacturing: SPOT '86 Conference and Exhibits.** Contact: Kathleen Warren, Technical Activities Department, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

MAY 20-22, ATLANTA — **Eastern Telecommunications Showcase.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

MAY 20-23, ORLANDO, FLA. — **Techex '86 Americas: The Annual World Fair for Technology Exchange.** Contact: Anne E. Klenner, Dr. Dvorkovitz & Associates, P.O. Box 1748, Ormond Beach, Fla. 32075.

MAY 21-23, NEW YORK — **Interconnections '86.** Contact: Independent Computer Consultants Association, P.O. Box 27412, St. Louis, Mo. 63141.

MAY 21-23, NEW YORK — **New York University Symposium on Information Technology and Management Strategy.** Contact: Kenneth C. Laudon, Graduate School of Business Administration, New York University, 90 Trinity Place, New York, N.Y. 10006.

WEEK OF MAY 25

MAY 28-29, WASHINGTON, D.C. — **Systems/34, 36 and 38 Users Show.** Contact: Andrew Wahtera, The Producers, 360 Merrimack St., Lawrence, Mass. 01843.

MAY 28-30, WASHINGTON, D.C. — **Stategic Data Planning and Modeling.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

MAY 29-30, SAN FRANCISCO — **Unix In Focus.** Contact: International Data Corp., Suite 201, 3350 W. Bayshore Road, Palo Alto, Calif. 94303.

MAY 29-31, BLACKSBURG, VA. — **Personal Computer Interfacing for Scientific Instrument Automation.** Contact: Linda Leffel, Virginia Polytechnic Institute and State University, Blacksburg, Va. 24061.

MAY 30-JUNE 2, ATLANTA — **Society of Telecommunications Consultants Spring Conference.** Contact: STC Headquarters, Suite 1410, One Rockefeller Plaza, New York, N.Y. 10020.

WEEK OF JUNE 1

JUNE 2-5, DETROIT — **Vision '86 — Applied Machine Vision Conference and Exposition.** Contact: Vision '86 Public Relations, Machine Vision Association of the Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 2-5, NASSAU BAY, TEXAS — **International Symposium on Ada Programming Language Applications for Space Station Development.** Contact: University of Houston — Clear Lake, 2700 Bay Area Blvd., Houston, Texas 77058.

JUNE 2-6, BOSTON — **Harmon Associates Seminars and Workshops.** Contact: Harmon Associates, 151 Collingwood, San Francisco, Calif. 94114.

JUNE 4, SAN FRANCISCO — **How to Build Your High Tech Career Network.** Contact: Association for Women in Computing, Bay Area Chapter, Suite 44, 55 Sutter St., San Francisco, Calif: 94104.

JUNE 4-6, BOSTON — **Engineering Expert Systems.** Contact: Harmon Associates, 151 Collingwood, San Francisco, Calif. 94114.

JUNE 4-6, SAN DIEGO — **1986 National Educational Computing Conference.** Contact: Susan M. Zgliczynski, National Educational Computing Conference 1986, School of Education, University of San Diego, Alcala Park, San Diego, Calif. 92110.

JUNE 5-6, CLEVELAND — **North Central Region Data Processing Trainer's Conference.** Contact: Gary Livingston, Livingston & Associates, P.O. Box 30619, Cleveland, Ohio 44130.

JUNE 7, BEIJING — **China-Didacta '86: The International Trade Fair for Educational Equipment.** Contact: Swiss Industries Fair, Secretariat China Didacta '86, P.O. Box CH-4021, Basel, Switzerland.

WEEK OF JUNE 8

JUNE 8-11, NEW ORLEANS — **Ethernet Decision-Makers Group Exchange Conference.** Contact: EDGE International, Inc., Suite 260, 1539 N. China Lake Blvd., Ridgecrest, Calif. 93555.

JUNE 9-10, TEANECK, N.J. — **Machover on Business Graphics.** Contact: Carol Every, Industry Rep-

See CALENDAR page 160

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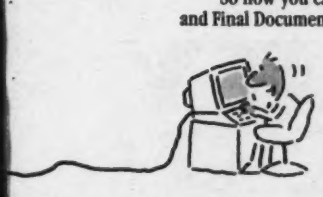

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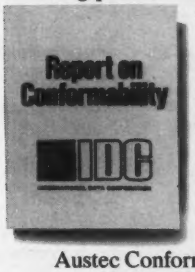

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CALENDAR from page 157

resentative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

JUNE 9-11, MYRTLE BEACH, S.C. — **The Association of Small Computer Users in Education 19th Annual Summer Conference.** Contact: Jack Cundiff, Horry-Georgetown Technical College, Conway, S.C. 29526.

JUNE 9-11, NORCROSS, GA. — **Time and Motion Study Fundamentals.** Contact: Institute of Industrial Engineers Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

JUNE 9-12, BOSTON — **Network Management/Technical Control Conference and Exposition.** Contact: CW/Conference Management Group, 375 Cochituate Road, Framingham, Mass. 01701.

JUNE 9-12, CHICAGO — **Com Lease Spring, The Computer Leasing Conference and Expo.** Contact: Show Management Offices, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

JUNE 9-13, SAN DIEGO — **MUMPS Users' Group 15th Annual Meeting.** Contact: MUMPS Users' Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

JUNE 10-13, ATLANTA — **Summer 1986 Unix Conference and Exhibition.** Contact: The Usenix Association Conference Office, P.O. Box 385, Sunset Beach, Calif. 90742.

JUNE 11, NEW YORK — **The Semiconductor Industry — Its Changing Structure 1986.** Contact: Robert Burton, L. F. Rothschild, Unterberg Towbin, 55 Water St., New York, N.Y. 10041.

JUNE 11-13, MAINZ, WEST GERMANY — **International Tandem Users' Group 1986 Spring Conference.** Contact: ITUG Headquarters, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

JUNE 11-13, TEANECK, N.J. — **Machover on CAD/CAM.** Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

JUNE 13, DETROIT — **James Martin Seminar — The End-User Revolution.** Contact: Thomas J. Bisacquino, Director of Education, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

WEEK OF JUNE 15

JUNE 15-20, LONG BEACH, CALIF. — **1986 Government Management Information Sciences Conference.** Contact: Tom Lang, Assistant Chairman, Data Processing Department, 9150 E. Imperial Highway, Downey, Calif. 90242.

JUNE 16-18, UNIVERSAL CITY, CALIF. — **Synergy '86, Conference on Functional Interfacing for Computer-Integrated Manufacturing.** Contact: Cheri Willetts, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 16-20, CAMBRIDGE, MASS. — **Managing Information Technology: New Responsibilities in a Changing Environment.** Contact: Center for Information Systems Research, Sloan School of Management, MIT, E40-193, 77 Massachusetts Ave., Cambridge, Mass. 02139.

JUNE 17-18, PLYMOUTH, MICH. — **Robotic End Effectors: Design and Applications Seminar.** Contact: Mary Dombrowski, Special Programs Division, Robotics International of the Society of Manufacturing Engineers, One SME Drive, P.O. Box 930, Dearborn, Mich. 48121.

JUNE 17-19, ATLANTIC CITY — **Plas-Tech '86.** Contact: Delia Associates, P.O. Box 338, Delia Marketing Communications Center, Whitehouse, N.J. 08888.

JUNE 18-20, TOKYO — **Marketing Opportunities Seminar.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

WEEK OF JUNE 22

JUNE 22-27, PHILADELPHIA — **Management Information Systems for Strategic Advantage.** Contact: The Registrar, Office of Executive Education, 200 Vance Hall, The Wharton School of the University of Pennsylvania, Philadelphia, Pa. 19104.

JUNE 23-25, ALBUQUERQUE, N.M. — **Integrated Fiber-Optic Technology Training.** Contact: Linda Castle, Optoelectronic System Consultants, P.O. Box 35525, Albuquerque, N.M. 87176.

JUNE 23-25, MIAMI — **Electronic Data Processing Auditors Association 14th Annual International Conference.** Contact: EDPAA, P.O. Box 88180, Carol Stream, Ill. 60188.

JUNE 23-26, BOSTON — **ATE East '86.** Contact: Registrar, Morgan-Grampian Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

JUNE 23-27, AMSTERDAM — **Fourth Annual European Fiber-Optic Communications and Local-Area Networks Exposition.** Contact: Cheryl MacDonald, Information Gatekeepers, 214 Harvard Ave., Boston, Mass. 02134.

JUNE 23-27, CHICAGO — **A/E/C Systems '86: The Computer and Management Show for the Design and Construction Industry.** Contact: Conference Director, A/E/C Systems '86, P.O. Box 11318, Newington, Conn. 06111.

JUNE 24-26, CHICAGO — **Structured Techniques Association III/Structured Techniques in the Eighties: Practice and Prospects.** Contact: Mary Anne Gabriel, Heller Financial Corp., 105 W. Adams St., Chicago, Ill. 60603.

JUNE 24-27, CHICAGO — **Autocad Expo '86.** Contact: William Ryan, Autocad Expo '86, Autodesk, Inc., 2320 Marinship Way, Sausalito,

Calif. 94965.

JUNE 25, CHICAGO — **International Facility Management Association's Computer Applications for Facility Management.** Contact: IFMA, Suite 1410, 11 Greenway Plaza, Houston, Texas 77046.

JUNE 25-26, COATESVILLE, PA. — **Chester County Expo '86: CAD/CAM Conference from Micro to Mini.** Contact: Lee Smith, Central Chester County Vocational Technical School, 1635 E. Lincoln Highway, Coatesville, Pa. 19320.

WEEK OF JUNE 29

JULY 2-3, LAS VEGAS — **Full Meeting of the Design Automation Standards Subcommittee.** Contact: Ron Waxman, Design Automation Standards Subcommitee cochairman, IBM FSD, 9500 Godwin Drive, Manassas, Va. 22110.

WEEK OF JULY 27

JULY 28-30, RENO, NEV. — **1986 Summer Computer Simulation Conference.** Contact: The Society for Computer Simulation, P.O. Box 17900, San Diego, Calif. 92117.

WEEK OF AUGUST 3

AUGUST 4-8, ANN ARBOR, MICH. — **Contemporary Data Communication Networks: Planning, Management and Computer-Based Design.** Contact: Engineering Summer Conferences, 300 Chrysler Center/N. Campus, Ann Arbor, Mich. 48109.

WEEK OF AUGUST 10

AUGUST 11-14, SNOWMASS, COLO. — **AM/FM International Ninth Annual Conference.** Contact: AM/FM International, Suite 820, 8775 E. Orchard Road, Englewood, Colo. 80111.

WEEK OF AUGUST 17

AUGUST 18-22, DALLAS — **Thirteenth Annual Conference on Computer Graphics and Interactive Techniques.** Contact: SIGGRAPH '86, Conference Management, Smith, Bucklin & Associates, Inc., 111 E. Wacker Drive, Chicago, Ill. 60601.

AUGUST 19-21, PHILADELPHIA — **Second Annual Physical and Electronic Security Symposium and Exposition.** Contact: Michael C. Otten, Booz, Allen and Hamilton, Inc., 4330 East-West Highway, Bethesda, Md. 20814.

WEEK OF AUGUST 24

AUGUST 26-28, SAN MATEO, CALIF. — **Interconnect '86.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

WEEK OF AUGUST 31

SEPTEMBER 1-5, DUBLIN — **International Federation for Information Processing Congress '86.** Contact: IFIP Congress '86, 44 Northumberland Road, Dublin 4, Ireland.

SEPTEMBER 2-5, CHICAGO — **Fourth Annual Office Automation Society International Conference.** Contact: Sue Pickard, OASI, Suite B, 15269 Mimosa Trail, Dumfries, Va. 22026.

SEPTEMBER 3-5, LOS ANGELES — **Telemarketing/West.** Contact: Doug Shreve, The Telemarketing Foundation, Inc., P.O. Box 829, Arnold, Md. 21012.

WEEK OF SEPT. 7

SEPTEMBER 8-10, PHILADELPHIA — **NCC — Telecommunications Conference.** Contact: NCC-Telecommunications, American Federation of Information Processing Societies, Inc., 1899 Preston White Drive, Reston, Va. 22091.

SEPTEMBER 8-18, MONTREAL — **43rd FID Conference and Congress.** Contact: Local Organizing Committee, FID 43rd Conference and Congress, C.P. 1144, Succursale Place Desjardins, Montreal, Quebec, Canada H5B 1B3.

SEPTEMBER 9-12, ANTWERP, BELGIUM — **Second European Simulation Congress.** Contact: The Society for Computer Simulation, c/o Ghislain C. Vansteenkiste, University of Ghent, Coupure Links 653, B-9000 Ghent, Belgium.

WEEK OF SEPT. 14

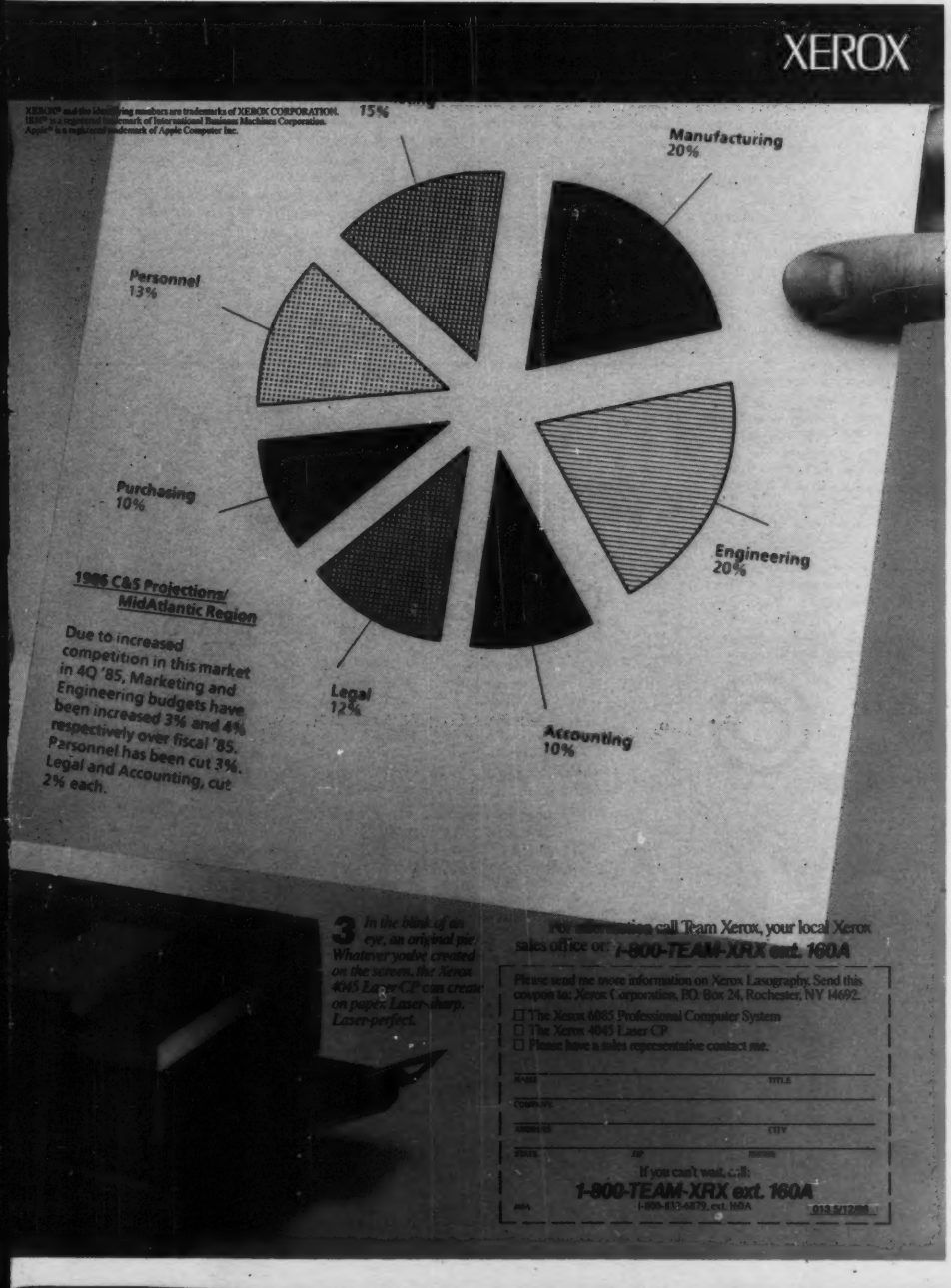
SEPTEMBER 18-19, MONTREAL — **Canadian Office Machine Dealers Association/Candex.** Contact: Roy Whitsed, Candex Conference, Inc., 47 Lakeshore Road E., Mississauga, Ont., Canada L5G 4L7.

WEEK OF SEPT. 21

SEPTEMBER 22-25, ORLANDO, FLA. — **Space Tech '86.** Contact: Society of Manufacturing Engineers Public Relations, Box 930, One SME Drive, Dearborn, Mich. 48121.

SEPTEMBER 23-25, NEW YORK — **International Videotex Industry Exposition and Conference.** Contact: Cahners Exposition Group, P.O. Box 3833, Cahners Plaza, 999 Summer St., Stamford, Conn. 06905.

SEPTEMBER 23-25, WIESBADEN, WEST GERMANY — **Artificial Intelligence and Advanced Computer Technology Conference/Exhibition.** Contact: Tower Conference Management Co., 331 W. Wesley St., Wheaton, Ill. 60187.



Systems vendors scaling back on in-house chip fabrication

Third-party production lets companies focus on semiconductor design

By Maura McEnaney

SUNNYVALE, Calif. — Data General Corp.'s recent closing of its in-house chip manufacturing facility came as no surprise to industry analysts, who have long been predicting market growth for independent application-specific integrated circuit manufacturers.

Last month, DG announced it would reduce its in-house volume chip production to concentrate instead on component design and development [CW, April 28]. Seventy-five workers were laid off, and most chip production will be shipped to merchant companies, according to DG.

At first glance, the announcement contradicts the earlier trend of systems vendors taking volume chip production in-house, as evidenced by Digital Equipment Corp.'s new semiconductor plant in Scotland. But DG's announcement is in line with another industry trend, analysts say.

"Developing chip designs is becoming more important than manufacturing," says Andrew Rappaport, president of Technology Research Group in Boston. According to Rappaport, sophisticated design tools allow systems companies to do more and better chip designs, leaving the production of what could be limited designs to chipmakers already equipped with costly manufacturing capabilites. "For companies like DG it is a much cheaper way to build chips," he notes.

Because application-specific integrated circuit manufacturers have weathered the current semiconductor slump fairly well, major commodity vendors, including Intel Corp., have announced their intentions to get into this business. The application-specific integrated circuit business has matured enough to handle volume production runs at cost-effective rates, which could eventually help lower system prices.

Rappaport says he believes that "a lot of companies will be scaling back on the use of their internal fabrications," a trend he says began several years ago when Wang Laboratories, Inc. abandoned its plans to build a chip foundry.

Only companies like IBM and DEC, which have the substantial investments and volumes to support wafer fabrication, will remain in the business, he predicts. Current estimates have IBM producing between 2.5 billion and 3 billion chips a year.

"Anybody who is bringing their fab in-house is either nuts or has more money than they have brains," says Matt Crugnale, a consultant wth Crugnale and Associates.

"Only the military has the luxury of doing in-house fabrication without having the volume to support it, and that is because of the proprietary nature of the product," Crugnale says.

DG does use proprietary chips, but they are not so proprietary that they risk design loss if a third party manufactures them, says Michael Kubiak, analyst at Kidder, Peabody & Co.

Although it recently closed a semiconductor facility in Cupertino, Calif., Hewlet-Packard Co. continues to manufacture its own custom chips. The company now operates four chip fabrication plants in California, Colorado and Oregon. "There is still a major opportunity for circuits made internally," says Fred Schwettmann, general manager of HP's integrated circuit group.

HP's decision to close the Cupertino facility came only because of excess capacity and not because of a switch to the application-specific integrated circuit market, he notes. "I think there is still a great deal of learning to do as far as the application-specific integrated circuit market is concerned," he says.

Mohawk sales clear loan defaults

PARSIPPANY, N.J. — Mohawk Data Sciences Corp. last week finalized the sale of five business units for approximately $90 million, removing itself from default on short-term bank loans.

The units will make up the bulk of a new private firm owned by two New York venture capital firms, J. H. Whitney & Co. and Welsh Carson Anderson & Stowe. Mohawk Data, which agreed to the sale last year, will own 10% of the new company and will hold one seat on its board.

Mohawk Data will use the funds from the transaction to support its one remaining computer business unit, MDS Qantel, Inc. Qantel is a vendor of minicomputers for various vertical markets, with reported sales of about $70 million in the fiscal year ended April 30.

The two venture capital firms purchased the Mohawk Data Service, Systems, Storms and Herkimer (N.Y.) Manufacturing divisions, as well as financial subsidiary MDS Credit Corp. Mohawk Data will receive royalties from the new firm for a 10-year period.

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MICROCOM™

Industry heirs: Akers, Olson

From page 190

nization will take over and instill a marketing sense similar to IBM's," Fritz Ringling of the Gartner Group, Inc. suggests.

The postdivestiture AT&T, barely 2 years old, is fighting to stave off low-cost competitors in its bread-and-butter long-distance telephone business, while at the same time striving to gain a foothold in the commercial computer market.

It is a $35 billion company still learning the art of marketing after decades of being a monopoly in regulated markets. Analysts say AT&T is a company in need of a take-charge leader with polished management skills who will make the painful but necessary pruning to elevate its competitiveness.

"Hopefully," says Kenneth Leon of L. F. Rothschild, Unterberg Towbin, "Olson will come on the scene like Peter the Great going through Russia."

No-nonsense Olson

Olson is considered a no-nonsense, energetic leader who is said to be better versed than Brown in the sundry businesses in which AT&T competes.

Observers say he has spent the last couple of years learning AT&T's broad array of products and is up to speed on its technology and marketing directions.

"He will be a more proactive leader vs. a reactive one because he's studied the market forces and understands the key markets AT&T is in," Leon says.

Detractors, however, say he is part and parcel of old-line management that has done very little to create the dynamics for AT&T to leverage its technological advantage in almost all of its markets.

Make good on promises

As chairman, Olson will have to make good on promises to trim the bloated corporation, promises analysts say he hasn't kept as president and chief operating officer. Olson pledged to cut expenses at AT&T Technologies by 20%. That objective, analysts say, was not met. And, while lauding his decision to excise 24,000 positions in the Information Systems Division, most analysts say they believe it was a move that should have been made months earlier.

"Under Brown, Olson didn't have the leeway to do what he wanted," Leon suggests. "He was a victim of AT&T's hierarchical management."

Olson will bring costs under control once he consolidates power, Leon says, because it is destined to become his legacy. "Brown will be known as the chairman who gets credit for surviving divestiture. Olson will get credit for focusing on costs and getting the company more competitive," he says.

> ***'Brown will be known as the chairman who gets credit for surviving divestiture. Olson will get credit for focusing on costs and getting the company more competitive.'***
>
> — Kenneth Leon
> L. F. Rothschild, Unterberg Towbin

The Gartner Group's Ringling argues that because of Olson's career-long association with AT&T, he will be caught in conflicting obligations. "Since he was brought up in the Bell tradition, he may feel he has to cater to his employees' needs," Ringling says. "On the other hand, he has to get costs down and reduce product redundancies. The toughest choice he might have to make is to lay off employees." Making it tougher is the fact that approximately 55% of AT&T's 340,000-member work force is unionized.

Despite the computer industry slump, layoffs seem unlikely to occur at IBM un-

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der Akers, although he has already stated that hiring, particularly at the entry level, will be reduced significantly [CW, May 5].

"Under Akers there will be a continued emphasis on efficiency within the confines of IBM's larger guidelines," says Smith Barney, Harris Upham & Co. analyst Donald Haback. "There will be no terminations or layoffs; employees will be retrained rather than fired," he says.

Considered by former coworkers and analysts as a consummate manager who has earned his blue stripes within the $50 billion corporation, Akers faces some difficult challenges. After years of sustained growth, IBM is mired in perhaps the most frustrating slump in its history. The firm is struggling to meet its sales and profit objectives, a situation caused by decreasing demand, increased worldwide competition and, according to some analysts, perceptible gaps in its product line, particularly in the minicomputer and communications areas.

Game for the task

Yet, according to former associates, Akers is game for the task. "He's good at understanding problems, how to get at root causes, ferreting out what needs to be done and delegating," notes ex-IBMer Watkins, who left Big Blue in 1985 after a 25-year career.

"He's so quick to get to the root of problems that it seemed as if he studied things for 48 hours before meeting to resolve them," says Tandon Corp. President Dan Wilkie, who worked under Akers as a manager at IBM's Entry Systems Division. "He went at a problem like a radar unit."

Watkins says Akers has special leadership qualities that set him apart from other IBM executives. "Someone once termed it command presence. People look to him for leadership," he says.

"He has the charisma necessary to run an organization as diverse as IBM's," says another former IBM executive who became president of a computer firm.

Outspoken Akers

Akers is more outspoken than Opel, whom analysts always say had been living in the shadow of his predecessor, Frank T. Cary. Despite the pervasive influence of the firm's management committees, Akers' character gives him the potential to leave his imprimatur on the company, industry and general economic conditions permitting. Like Cary, Akers will simultaneously hold the offices of chairman, president and CEO, which Opel never did.

One area in which Akers is sure to have an impact is cost containment. Like Cary, the force behind IBM's move to become the low-cost producer in the computer industry, Akers will be known as the chairman who made Big Blue the "low-cost marketeer," Watkins says. "He's going to put a full-court press on marketing expenses," Watkins suggests. "These are expenses that tend to be high, and John understands this."

> ***Like Cary, the force behind IBM's move to become the low-cost producer, Akers will be known as the chairman who made Big Blue the low-cost marketeer.***

According to Stephen Dube, a Shearson Lehman Brothers, Inc. analyst, Akers is also bound to be more aggressive. Dube points to a recent press conference in which Entry Systems Division President William Lowe publicly warned Personal Computer clone manufacturers that IBM would be turning the competitive heat one notch higher in the near term. "I'm sure Lowe wouldn't have said that without the blessing of Akers," Dube says.

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COMPUTER INDUSTRY

Sequent signs deal with Amperif

OEM agreement worth $20 million

By Donna Raimondi

BEAVERTON, Ore. — Sequent Computer Systems, Inc. has signed a four-year, $20 million OEM agreement with Amperif Corp. of Chatsworth, Calif.

The contract, which specifies that Sequent will provide its Balance 8000 parallel computer system and various components to Amperif, comes two months after a $50 million deal that Sequent inked with the German firm Siemens AG.

Sequent's total OEM contracts signed during the past 10 months amount to more than $80 million, according to Scott Gibson, Sequent's executive vice-president and chief operating officer.

"Taken all together, the Siemens and Amperif deals, along with several smaller ones Sequent has made, are very impressive evidence of their success," said Omri Serlin, president of research firm Itom International in Los Altos, Calif. "This really puts them way ahead of everyone else in that market, even though other companies, like Encore, get all the attention." Serlin pointed out that Sequent is only in its second year of shipments.

Micro exhibits betray blahs

From page 190

was all business — and a tough business at that.

Take Ability, the integrated micro software program that debuted with a splashy ad campaign and a $495 price tag last year. Its developer, Xanaro Technologies, Inc., is now bankrupt in Canada, and the Ingram Distribution Group, Inc. was hawking Ability at Comdex for $99. "I guess it's worth taking a flyer on at that price," Stinson shrugged. So much for "the next Dbase II."

Granted, the healthy dose of rough economic times in the micro industry has not been all bad for the corporate user. Recent software vendor trends to end copy protection and develop corporate site licensing plans prove that. And even Atari Corp. and Commodore International Corp. are making bids for the corporate dollar.

But on the down side, it doesn't seem to be the season for innovation. The next-generation Intel Corp. 80386-based micros may change that, but the new wave of products will not have the set-the-world-on-fire feel that pervaded Comdexes past. There may be less vaporware, but there will be less excitement as well. ■

Just a footnote on the demise of Future Computing, Inc.: Jeffrey Tarter, editor of "Softletter," a micro software newsletter in Cambridge, Mass., formerly used market research estimates of vendor sales in compiling the annual "Software 100."

"Unfortunately," Tarter wrote in notes to the 1986 list, "the numbers from analysts often turned out to be ridiculously wrong." Tarter now relies only on data from company sources. Enough said.

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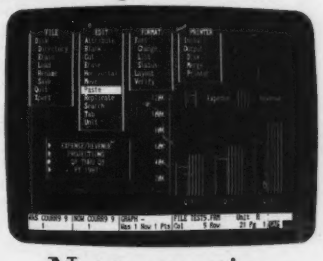

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Apple prepares to invest earnings in third-party developers

Applications received for capital, personnel

By Peggy Watt

CUPERTINO, Calif. — Apple Computer, Inc. has begun accepting applications from software and hardware developers for its new Strategic Investment Group, which will give capital and other resources to third-party companies developing Apple-related products.

Apple claims to have received "hundreds of inquiries daily" after Chairman John Sculley announced the group earlier this year. Interested companies are asked to submit business plans to Apple for consideration and review.

Apple plans to help fund a few high-quality and innovative companies whose products can help expand Apple's own market, according to Daniel Eilers, general manager of the new group.

Apple officials will not say how much seed money the company expects to plant, but they indicated personnel and other resources would be available as well. The company declines to call the plan "venture capital," emphasizing that it will invest only in projects that will complement Apple products.

The strategic investment group expects to make its first awards by late summer after a three-month evaluation of business plans, Apple officials said. They expect the investment group to continue indefinitely.

Apple is particularly looking at companies with projects in Apple's own target markets this year: business, education and consumer products, according to a spokeswoman. Among specific areas of interest are communications graphics, artificial intelligence, applications generators, high value-added applications and products integrating software with video and compact disk/read-only memory technology, she added.

Interested companies are asked to submit information on the company history and personnel, product and market information, a proposal for the product development for which it wants Apple's help and a review of the company's financial status.

"The initial response . . . has been tremendous," Eilers said. "There appears to be significant interest in Apple-related product development."

The project is an indication of Apple's stepped-up research and development activity, promised by Apple officials earlier this year. In a recent meeting with securities analysts, Sculley also predicted strong earnings for the rest of the fiscal year, which ends in September. Sculley said the company was willing to invest more heavily in marketing, sales and product development.

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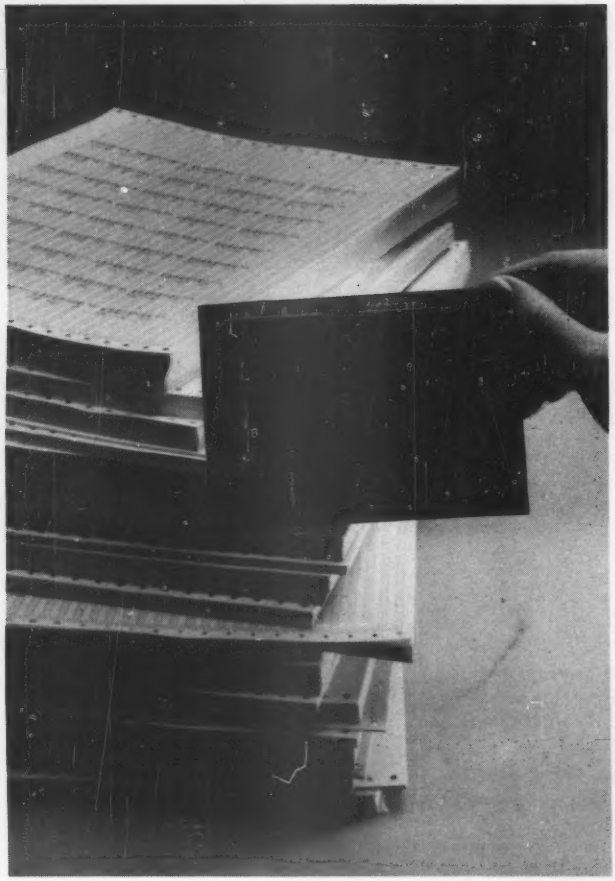

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Electronic Data Systems Corp. reported net income for the first quarter ended March 31 of $55.6 million, or 45 cents per share, on revenue of $997 million. This compares with net income of $38 million, or 32 cents per share, on revenue of $689.1 million reported a year ago.

■

Convergent Technologies, Inc. announced revenue for the first quarter ended March 31 of $73.5 million, compared with $92.6 million in the comparable period a year ago. Profits were $1.9 million, or 5 cents per share, compared with $2 million, or 1 cent per share, in the previous year.

■

Software Publishing Corp. reported revenue for the second quarter of $5.7 million, compared with $8.6 million in the previous year. Profits were $365,000, or 5 cents per share, compared with $1.3 million, or 18 cents per share, last year.

■

Computer Task Group, Inc. announced net income for the first quarter ended March 31 of $1.3 million, or 27 cents per share, on revenue of $32.7 million. This compares with net income of $773,000, or 24 cents per share, on revenue of $26 million reported in the previous year.

■

Mentor Graphics Corp. announced revenue for the first quarter ended March 31 of $37.1 million, compared with $32.3 million last year. Profits were $1.9 million, or 12 cents per share, compared with $3.1 million, or 22 cents per share, in the like period a year ago.

■

Data I/O Corp. posted revenue for the first quarter ended March 27 of $16.1 million, compared with $13.9 million a year ago. Profits were $1.2 million, or 12 cents per share, compared with $1.6 million, or 16 cents per share, last year.

■

Intelogic Trace, Inc. posted revenue for the second quarter ended Jan. 25 of $39.6 million, compared with $38.5 million last year. Profits were $5 million, or 32 cents per share, compared with $4.5 million, or 24 cents per share, a year ago.

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NICKELS AND DIMES

Tandon Corp. announced revenue for the second quarter ended March 28 of $58.2 million, compared with $61.1 million in the previous year. Net income was $1.9 million, or 4 cents per share, compared with a net loss of $19.9 million, or 39 cents per share, in the like period a year ago.

■

Wyse Technology, Inc. reported revenue for the fourth quarter ended March 31 of $46.3 million, compared with $35.3 million a year ago. Profits were $3.7 million, or 33 cents per share, compared with $1.6 million, or 18 cents per share, one year ago.

■

Britton Lee, Inc. announced revenue for the first quarter ended March 31 of $7.2 million, compared with $6.5 million in the comparable period a year ago. Profits were $189,000, or 2 cents per share, compared with $938,000, or 12 cents per share, reported in the like quarter one year ago.

■

Intecom, Inc. announced revenue for the first quarter ended March 31 of $20.8 million, compared with $30.5 million a year ago. The company also reported a net loss of $7.9 million, or 24 cents per share, compared with a net loss of $1.1 million, or 3 cents per share, in the same quarter one year ago.

■

Micom Systems, Inc. announced revenue for the quarter ended March 31 of $189.5 million, compared with $193.3 million in the previous year. Profits were $10.8 million, or 62 cents per share, compared with $25.7 million, or $1.48 per share, in the like quarter a year ago.

■

Trilogy Ltd. reported revenue for the first quarter ended March 30 of $6.9 million, compared with $5.2 million in the comparable period a year ago. The company also announced a net loss of $5.2 million, or 8 cents per share, compared with a net loss of $7.7 million, or 14 cents per share, in the previous year.

■

NBI, Inc. reported a loss of $2.4 million, or 25 cents per share, on revenue of $67.6 million for the third quarter ended March 31. This compares with net income of $4 million, or 42 cents per share, on revenue of $54.6 million reported for the comparable period one year earlier.

■

Infotron Systems Corp. announced first-quarter revenues of $19.1 million, compared with $18.3 million a year ago. Profits were $347,000, or 7 cents per share, compared with $1.8 million, or 35 cents per share, in the previous year.

■

Policy Management Systems Corp. reported net income for the first quarter ended March 31 of $3.1 million, or 19 cents per share, on revenue of $32 million. This compares with net income of $3.8 million, or 24 cents per share, on revenue of $25 million in the like period a year ago.

■

Maxtor Corp. announced revenue for the quarter ended March 31 of $26.5 million, a 62% increase over the $16.4 million reported in the like quarter a year ago. Profits were $3.9 million, or 51 cents per share, compared with $1.7 million, or 30 cents per share, in the previous year.

The company also reported revenue for the year ended March 31 of $85.2 million, a 96% increase over last year's $43.5 million. Profits for the year were $10.7 million, or $1.56 per share, compared with $38,000, or 1 cent per share, in the previous year.

■

Alpha Microsystems, Inc. reported a loss for the fourth quarter ended Feb. 23 of $1.5 million, or 47 cents per share, on revenue of $11.4 million. This compares with year-earlier net income of $66,000, or 2 cents per share, on revenue of $12.1 million.

For the year ended Feb. 23, the company reported a loss of $3.5 million, or a $1.10 loss per share, on revenue of $48.2 million. This compares with net income of $2.1 million, or 65 cents per share, on revenue of $51.7 million for the previous year.

■

Teknowledge, Inc. reported revenue for the third quarter ended March 31 of $4 million, compared with $1.6 million in the previous year. Profits for the quarter were $357,700, or 7 cents per share, compared with a net loss of $1.1 million, or 41 cents per share, in the like period a year ago.

■

TIE/Communications, Inc. reported a first-quarter loss of $2.6 million, or 7 cents per share, on revenue of $82.8 million. This figure compares with a net loss of $6.7 million, or 19 cents per share, on the company's revenue of $88.8 million in the previous year.

CPT Corp. announced revenue for the third quarter ended March 31 of $24.1 million, compared with $42 million one year ago. The company reported a net loss of $4.9 million, or a 31 cents loss per share, compared with net income of $152,000, or a 1 cent loss per share, in the comparable period last year.

■

Integrated Software Systems Corp. announced revenue for the first quarter ended March 31 of $8.5 million, compared with $7.7 million a year ago. Profits were $374,000, or 7 cents per share, compared with $420,000, or 8 cents per share, in the like period one year ago.

■

Emulex Corp. announced net income for the third quarter ended March 31 of $2.2 million, or 16 cents

See NICKELS page 171

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EXECUTIVE CORNER

Electronic Data Systems Corp. (EDS) announced the following appointments: **Lester M. Alberthal Jr.**, senior vice-president in charge of EDS' North American business operations, will become the company's new president, succeeding **Morton H. Meyerson**, who was named to the new position of vice-chairman. The vice-president in charge of finance and administration, **J. Davis Hamlin**, will become the company's new chief financial officer, succeeding **J. Thomas Walter Jr.**, and **Gary Fernandes**, senior vice-president, has been named chairman of EDS International Ltd. and will oversee all of EDS' international operations.

■

James A. Pitts was named executive vice-president of finance, administration and strategic planning of Cullinet Software, Inc. Previously with Digital Equipment Corp. in several financial and strategic planning management assignments and with Xerox Corp. as controller and manager of planning and development, Pitts most recently held the position of vice-president, corporate controller with Data General Corp. Pitts will also serve as interim chief financial officer because of the resignation of **Phyllis S. Swersky**, former senior vice-president and chief financial officer.

■

National Semiconductor Corp. has created two new business organizations — the Information Systems Group and the Semiconductor Group — that consolidate all National Semiconductor business operations under two corporate executive vice-presidents: **James Smaha**, who was promoted from head of the company's semiconductor division to executive vice-president of the corporation and the Semiconductor Group; and **David Martin**, who was promoted to executive vice-president of the corporation and the Information Systems Group and also is president of National Advanced Systems Corp., a subsidiary of National Semiconductor. Both men were named to the board of directors.

■

J. Tracy O'Rourke was appointed chief executive officer of Allen-Bradley in addition to his position as the company's president. **C. R. Whitney** will continue to serve as chairman and an officer, but O'Rourke is assuming chief executive officer responsibilities of the Rockwell International Corp. subsidiary.

■

Rexon, Inc. named **Michael O. Preletz** chief executive officer. **Glenn O. Maddalon** was appointed president of Rexon's Wangtek tape drive subsidiary.

■

John A. Lockitt was promoted to president and chief executive officer of Codex Corp. Lockitt formerly served as senior vice-president for Wide Area Network Operations. He succeeds **James W. Storey**, who accepted an assignment reporting to the chief executive officer of Motorola, Inc., Codex's parent company.

■

The Massachusetts Computer Software Council named **Joyce L. Plotkin** to the new position of executive director. Plotkin will be responsible for overall management of the council's activities, including marketing, policy and program development and financial goals.

■

Robert K. Iyobe was appointed president of C. Itoh Electronics, Inc., replacing **Mark M. Takeuchi**, who had held the position since the company was founded in 1973.

■

Scientific Leasing, Inc. replaced its president and chief operating officer, **Leonard S. Cohen**, a founder of the company and president for approximately one year. Cohen, 49, will continue to serve on the board of directors. Succeeding him is **W. Barry Turner**, 35, a director and senior vice-president.

■

Decision Data Computer Corp. appointed **Richard J. Schineller** chairman of the board. Schineller, who joined the company as president in March 1980, bringing prior experience from Management Assistance, Inc., Sorbus, Inc. and IBM, will continue to serve as chief executive officer. He succeeds **Carl W. Stursberg**, who will remain a director of the company. **Joseph J. Ciasullo** was named president and will continue as chief operating officer.

■

Digital Equipment Corp. promoted three senior managers to vice-presidential positions: **Ilene B. Jacobs**, vice-president, corporate treasurer; **Bruce J. Ryan**, vice-president, corporate controller; and **David L. Stone**, vice-president, international engineering and strategic resources.

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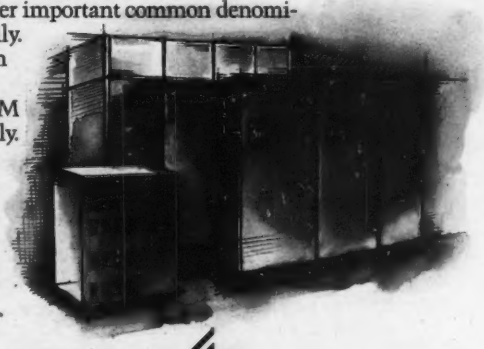

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NICKELS from page 170

per share, on revenue of $27.2 million. This compares with net income of $1.8 million, or 13 cents per share, on revenue of $27.2 million reported in the previous year.

■

Computer Sciences Corp. announced revenue for the fourth quarter ended March 28 of $236.8 million, compared with $198.8 million in the like period a year ago. Profits were $8.9 million, or 61 cents per share, compared with $7.2 million, or 53 cents per share, one year ago.

For the year, the company's revenue was $838.6 million, up 16% from $72.5 million in the previous year. Profits for the year were $23.9 million, or $1.69 per share, compared with $27.7 million, or $2.02 per share, one year ago.

VLSI microsensors: The eyes and ears of future computers

OUTSIDE LINES
Bohdan Szuprowicz

Recent breakthroughs in very large-scale integration (VLSI) and semiconductor materials have led to the development of microsensors that many see as the "eyes and ears" of future computers and as having many practical artificial intelligence (AI) applications.

Microsensors are microscopic devices, often developed as part of an integrated circuit microchip, that can provide real-time measurement of changes in their operating environments. These devices exploit the mechanical and electrical properties of silicon microchips "doped" with specific impurities to respond electronically to changes in physical conditions.

They instantaneously measure and transform into digital signals such changing parameters as stress, pressure, temperature, radiation, gas concentration, humidity, vibration, speed, acceleration, light intensity, fluid properties and, more recently, even object shapes using newly developed tactile sensor technologies.

In a typical control system, a microprocessor or computer reacts to input signals that originate in sensors or man-machine interfaces such as a keyboard. Now microsensors can be incorporated into the same microchips containing the electronic circuits of a whole system, thereby greatly reducing the cost and enhancing the operating speeds.

Szuprowicz is president of 21st Century Research of North Bergen, N.J., and publisher of Supergrowth Technology USA.

Japanese contribution

Not surprisingly, as a result of their much-touted fifth-generation computer program, the Japanese have been performing extensive sensor research in their quest to devise what they call "the ideal computer." Such a computer includes AI features such as knowledge processing, pattern recognition, learning, inference, self-education, understanding and reasoning capabilities. The Japanese have estimated that such a system would have to have about 100 trillion bits of memory and at least 128-bit word length to accommodate massive streams of data.

Such awesome power seems to be well out of reach of many computer users. Chances are that actual development in the industry will proceed along more specific application lines, where expert systems designed around customized AI microchips with microsensor capabilities will be more than adequate to provide near-ideal solutions.

What is important in either case, however, is the need for sensors that can provide the system with inputs in real-time and permit it to develop expert response and advice faster than a human expert. To operate in a human environment, such systems must include input sensors that can duplicate human senses.

As a result, the Japanese estimate that 60% of sensor inputs for an ideal computer will consist of vision in one form or another, because vision is by far the most useful of human senses.

Voice recognition is the next most important sensor category and is expected to contribute about 20% of sensor inputs to the ideal computer. Voice-activated devices are, in fact, becoming an important element of the information revolution today. Touch is the next category, contributing 15% of sensor inputs, followed by taste accounting for 3% and smell for 2%. All of these estimated contribution percentages closely reflect the importance of human senses.

The small sensors market is already a $1 billion industry, primarily catering to commercial, military and aerospace applications. Microsensors are estimated to account for 25% of that total. If microsensor growth keeps up its current rate of growth, experts say it will become a $1 billion market in its own right as early as the 1990s.

This process may accelerate as availability of expert systems software, powerful new hardware, and customized VLSI microchips combine to create an upsurge in microsensor demand.

Newcomers in the field already compete against some well-established firms like Honeywell, Inc., IBM, Motorola, Inc. and National Semiconductor Corp. as well as the ubiquitous Japanese companies, including Hitachi Ltd., NEC Corp. and Yokogawa Hokushin Electric Corp.

The advent of custom VLSI microchips and AI applications opens up a new era in information processing to innovative specialist firms that know how to package the microsensors into superior products for specific markets.

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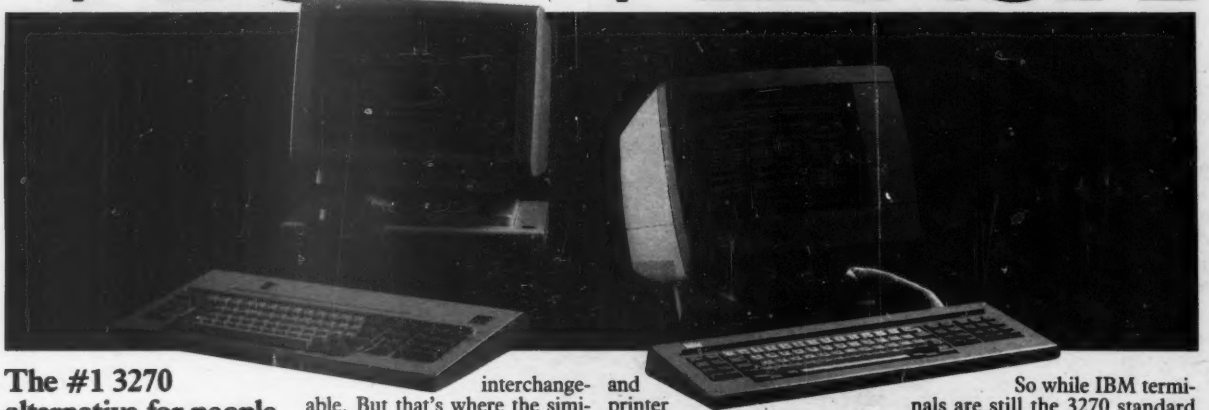

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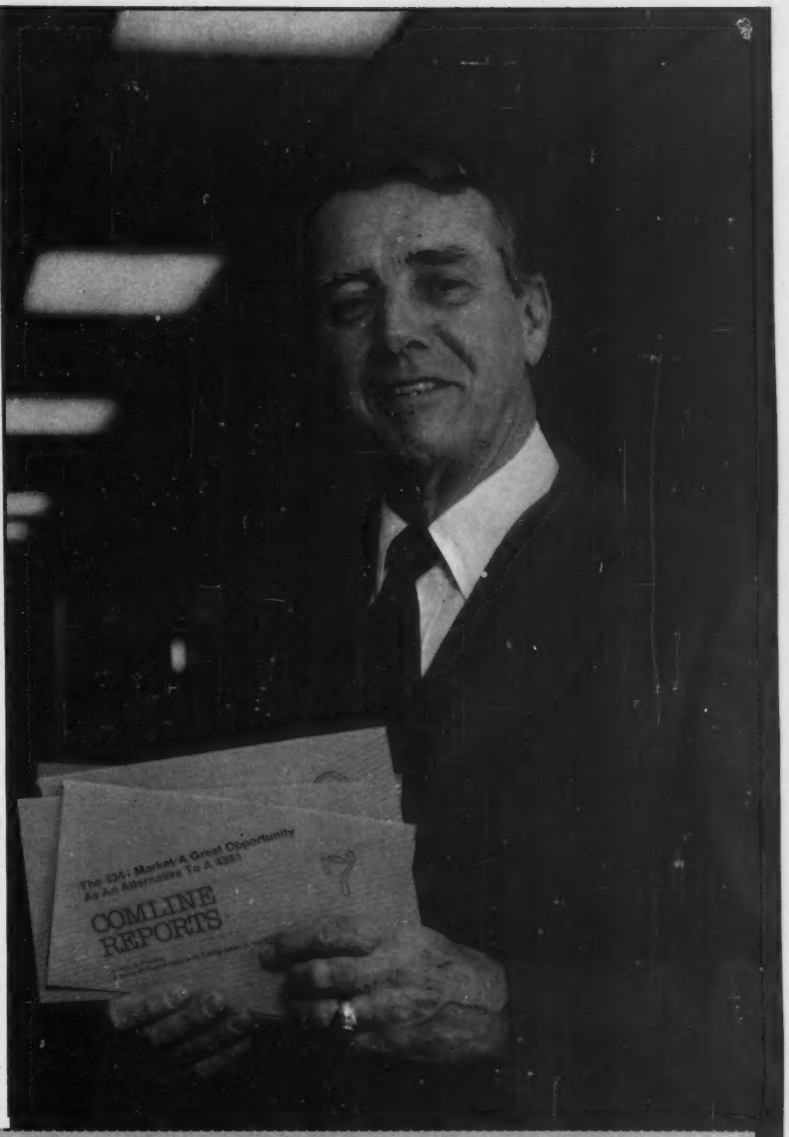

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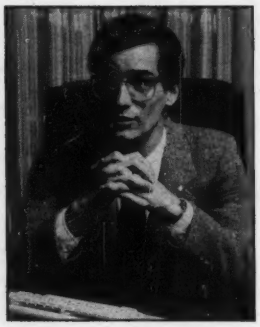

When Virtual Microsystems, Inc. wanted to tell Fortune 1000 MIS/DP directors that its BRIDGE System allows VAX and Micro VAX users to run IBM PC software from any terminal on their systems, the company quickly discovered that Computerworld delivers the very audience that Virtual is targeting.

According to Don Elzbach, Vice President/Marketing, Virtual salespeople recognize a lead generated by Computerworld as a higher quality, more valuable lead than others that Virtual receives. *"We've found that the people who respond to Computerworld ads are higher-level management in the exact companies we want to reach. These managers have control of the budgets; they are the ones that are spending the money,"* explains Don.

Don says the high quality of leads generated by Computerworld is borne out by the close ratio. *"Our close ratio is almost twice as high with leads from Computerworld than from any other publication that we use,"* reports Don.

Quantity and quality at the same time? *"Definitely,"* says Don. So much so, in fact, that following an earlier campaign, Virtual wrote to Computerworld and happily announced that *". . . it paid off! We are not only getting a satisfactory quantity of leads, but we're seeing a higher quality than ever before."*

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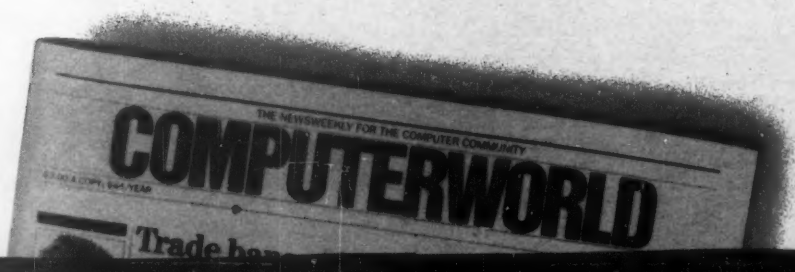

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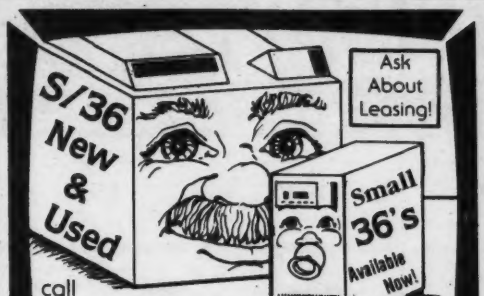

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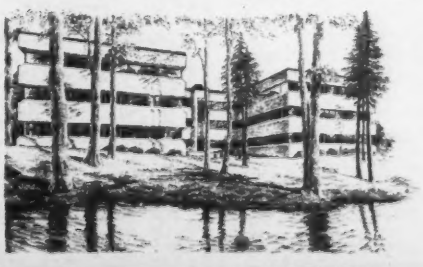

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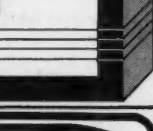

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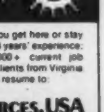

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CDC reassures shareholders

Continues to trim debt with sale of Ticketron

By Stanley Gibson

MINNEAPOLIS — Despite Control Data Corp.'s losses of more than $500 million last year, CDC stockholders were remarkably quiet at last Wednesday's annual meeting. Their silence appeared to give tacit acceptance to the measures taken to reverse CDC's slide and may indicate that, like CDC's management, most shareholders believe that better days lie ahead.

One remedial step, the sale of the firm's Ticketron division, was announced the day before the meeting. CDC signed a definitive agreement for the sale of Ticketron to an investment group led by Allen & Co., a private New York investment banking firm. Though terms were not disclosed, one unsuccessful bidder reportedly offered $165 million.

In the short term, CDC must repay, by the end of the year, $380 million in bank loans on which it has defaulted or face a stiff penalty. In February, CDC and its creditor banks reached an agreement on repayment terms in which the company's Commercial Credit Co. and Arbitron units were pledged as collateral.

CDC Chairman, President and Chief Executive Officer Robert M. Price said that Commercial Credit, the firm's financial services unit, could be one of the assets sold in the debt refinancing plan.

Some of the proceeds of last week's announced sale of Ticketron will go toward debt repayment, and additional assets will be sold to satisfy the banks. Price said he expects "modestly positive" cash flow for the year but that it will be "nowhere near" sufficient to repay the debt. Some $80 million to $150 million remaining must be repaid, and Price said he was weighing the sale of equity, the acquisition of medium-term debt and the sale of still more assets to fill that gap.

Price sent out the message that his time at the helm will be radically different from founder William C. Norris'. While under Norris, CDC grew by branching in many directions; under Price, many of those branches will be pruned.

"In those areas where we do not have superior market share or do not offer a competitive advantage, we will exit the business," Price said.

Norris was present at the meeting but made no remarks. The founder stepped aside in January 1986 when Price took over the reins of the troubled firm. Norris retains the title of chairman emeritus and will be paid $1.5 million during five years as an independent consultant.

Price said that the company has trimmed its work force from 54,000 employees on Jan. 1, 1985, to a current total of 41,400. Price said he expects the number of employees to be roughly the same by the end of the year.

Datapoint buyout proposal halted

From page 190

million outstanding shares. Datapoint's stock traded at roughly $6.50 per share last week on the New York Stock Exchange.

"We will be announcing our third-quarter results in about two weeks, and we have stated publicly that we anticipate modest profits for that quarter," Gistaro said. "On the basis of that, Edelman has reconsidered his offer."

With a reputation for acquiring troubled companies and liquidating them for their assets, Edelman is currently attempting a similar buyout for the Fruehauf Corp., a Detroit-based trailer manufacturer.

Edelman declined comment on whether that prospect had anything to do with the termination of the Datapoint offer.

Televideo wins $10.4 million in suit

By Maura McEnaney

SAN JOSE, Calif. — Televideo Systems, Inc.'s former Chief Financial Officer Fred Heidenthal has been ordered to pay the terminal manufacturer and its founder, K. Philip Hwang, more than $10.4 million for the misappropriation of company funds that Heidenthal allegedly used in part for gambling in Nevada and Atlantic City.

In a favorable ruling on a civil complaint filed by Televideo in July 1983, U.S. District Court Judge William Ingram also ordered Heidenthal to give up ownership of approximately $3 million in Televideo stock.

The order is the result of a three-year suit against Heidenthal and two associates over a 1983 scheme that embezzled approximately $3.3 million from both Hwang and Televideo. Damages in the case were tripled in accordance with racketeering charges.

According to Televideo's complaint, Heidenthal, while acting as Televideo's chief financial officer, used approximately $1.2 million in company funds for his own purposes and later convinced Hwang to sell $1.9 million of personal stock to invest in a fictitious entity. Heidenthal used the money to invest in real estate and gamble in Nevada casinos, according to Televideo.

David Van Heosen, an attorney for Heidenthal, said an appeal "was being discussed." Heidenthal is also suing Televideo in attempts to recover pension and profit sharing funds from the firm. That case is pending.

Ingram's order came after Heidenthal admitted to perjuring himself during the legal deposition process, Televideo lawyers said. As a result, the judge denied Heidenthal an opportunity to present his case and entered a default judgment against the defendant.

Software stocks appear ripe for market comeback

ACTIVE ISSUES
Kathy Porteus

After being beaten down to historic lows, companies like Cullinet Software, Inc. (CUL — 13¾) are attracting renewed interest not because of notable fundamental improvements but because of increased investor sentiment that such stocks have been oversold. Micro software companies, such as Lotus Development Corp. (LOTS — 35½), also show budding health.

This activity further benefits systems software stocks like Computer Associates International, Inc. (CASI — 41) and Pansophic Systems, Inc. (PNS — 33½). These firms have fared better than other mainframe software firms partly because systems software products are priced low enough to avoid budget constraints and acquisition procedures. Recently, Computer Associates and Pansophic traded at all-time highs, but some still view these as undervalued stocks.

"If you believe Computer Associates and Pansophic can grow at 30% or better," says W. Christopher Mortenson, analyst with Alex Brown & Sons, "then these stocks are not valued at that much of a premium compared to the rest of the market." Mortenson recommends purchase of both companies.

Rick Sherlund, analyst with Goldman, Sachs & Co., says investors are attracted to Computer Associates and Pansophic because they show effective management, good product flow and continued high rates of growth. "This increases investor comfort levels at a time when many are still nervous about the economy," he says.

Sherlund says Pansophic, which focuses on program-library control systems, retrieval systems and applications development tools, is expanding into other information center tools, such as a query language that is compatible with IBM's DB2 data base management system. Analysts estimate Pansophic will earn $1.70 a share in the fiscal year ended April 30 and $2.05 to $2.10 a share in fiscal 1987.

Timothy McCullom, technology analyst with Dean Witter Reynolds, Inc., says Computer Associates benefits from strong sales in its systems software and international businesses. About 30% of its revenue comes from applications, data base and micro software product areas that analysts say are only breaking even.

"But Computer Associates is very good in controlling costs when it sees some business slowing down," says McCullom, who expects a "pickup this year in their applications and micro software products." McCullom estimates the company will report 1986 earnings per share of $1.65 to $1.75 and will earn $2.10 a share in the current fiscal year ending March 31, 1987.

Should investors jump on the systems software bandwagon?

Alex Brown's Mortenson says he thinks these stocks will continue to do well because of good market conditions and steady demand for utility software. "But because these stocks haven't hurt as much in the downturn, they won't benefit as much from an upturn," he says.

According to Stephen McClellan, vice-president with Merrill Lynch, Pierce, Fenner and Smith, Inc., the investment outlook for the whole software group is gradually improving. Some investors buy Computer Associates because it is viewed as a leader of the group, McClellan says.

"But you can probably make more money with software stocks that have disappointed so when the business outlook improves, there will be a more dramatic change in valuation," he says. For these reasons, McClellan recommended purchase of Cullinet when it recently traded at 11⅛.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

INDUSTRY NOTES

IBM signs OEM pact with Hogan

IBM and **Hogan Systems, Inc.** finalized a long-term OEM agreement whereby IBM will exclusively market, support and service Hogan banking software in the U.S. and Canada. The deal represents IBM's most aggressive move to date in marketing mainframe software from an independent applications vendor and will provide the bulk of Hogan's revenue in the current fiscal year. Current Hogan users will continue to receive service and support from Hogan as they make the transition to the IBM versions of Hogan applications, a spokesman said.

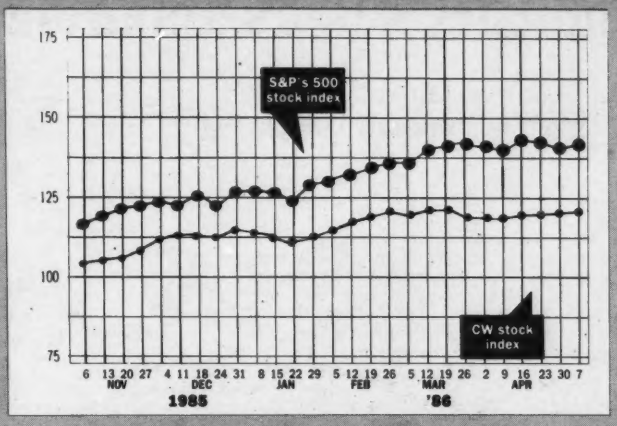
■

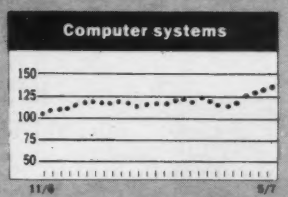
Wyse Technology, Inc. named Phillip White president and chief operating officer, replacing Bernard Tse, who was elected chairman of the board. White is a former senior vice-president of sales and marketing at **Altos Computer Systems, Inc.**, which recently sold off its 26% ownership share in the San Jose, Calif., terminal manufacturer.

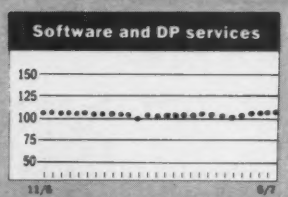
COMPUTER INDUSTRY

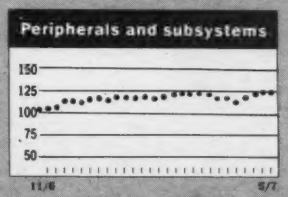
MITCHELL J. HAYES

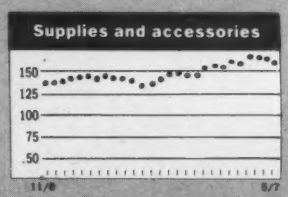
Computerworld stock trading index

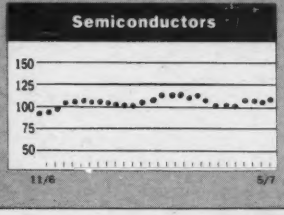


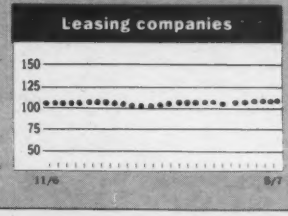












All indexes reflect a historical base of 100 on Dec. 31, 1984, and trace stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.

	4/30/86	5/7/86
Computer systems	128.7	**131.0**
Software and DP services	105.8	**106.2**
Peripherals and subsystems	122.2	**123.0**
Supplies and accessories	156.3	**154.2**
Semiconductors	110.5	**111.9**
Leasing companies	105.0	**105.8**
CW stock index	121.1	**121.9**
Standard and Poor's 500 stock index	140.8	**141.2**

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, MAY 7, 1986

COMPUTER SYSTEMS

EXCH		52-WEEK RANGE (1)	CLOSE MAY 7 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	5- 9	6 5/8	+3/8	+6.0
O	ALTOS COMPUTER SYST	9- 19	17 7/8	-1 3/8	-7.1
A	AMDAHL CORP	10- 18	16	0	0.0
O	APOLLO COMPUTER	9- 31	16 1/4	+1/2	+3.1
O	APPLE COMPUTER INC	14- 32	31 1/2	+1 1/4	+4.1
N	AT&T	19- 28	25	+1/4	+1.0
N	BURROUGHS CORP	52- 71	62 7/8	+1 7/8	+3.0
O	COMPAQ COMPUTER CP	5- 18	17 1/2	+3/4	+4.4
O	COMPUTER AUTOMATION	1- 9	2 1/4	+1/8	+5.8
A	COMPUTER CONSOLES	5- 14	11 1/8	+1/2	+4.7
N	CONTROL DATA CORP	15- 39	23 7/8	+1	+4.3
O	CONVERGENT TECHNOL	5- 13	9 1/2	-1/4	-2.5
O	CPT CORP	5- 8	4 1/2	0	0.0
N	CRAY RESEARCH INC	25- 82	82	+3 1/8	+3.9
O	DAISY SYSTEMS CORP	11- 38	13	-1/2	-3.7
N	DATA GENERAL CORP	31- 70	40	-1 5/8	-3.9
N	DATAPOINT CORP	5- 22	6 1/2	+1 1/4	+23.8
N	DIGITAL EQUIPMENT	85- 181	173 7/8	-2 5/8	-1.4
A	EECO INC	13- 16	15 1/4	+1/4	+1.6
N	ELECTRONIC ASSOC	3- 7	5 7/8	0	0.0
N	FLOATING POINT SYST	18- 42	38 3/4	-3 1/2	-8.2
N	FOXBORO	22- 31	30 3/4	+3 1/2	+12.8
N	GOULD INC	20- 38	26 3/4	+1	+3.8
N	HARRIS CORP	22- 35	32 1/2	+1/4	+0.7
N	HEWLETT-PACKARD CO	29- 45	45 1/8	-1/8	-0.2
N	HONEYWELL INC	54- 87	78	+2 7/8	+3.8
N	IBM	117- 158	151 1/4	-5	-3.1
O	IPL SYSTEMS INC	1- 4	2 3/8	-1/8	-5.0
N	ITT CORP	28- 48	47 1/2	+3/8	+0.7
N	M/A-COM INC	13- 24	16 1/4	-5/8	-3.7
N	MANAGEMENT ASSIST	2- 28	2 3/8	+1/8	+5.5
N	MATSUSHITA ELEC(ADR)	49- 98	92 3/8	-6	-6.0
O	MENTOR GRAPHICS	13- 30	18 3/4	+1 1/4	+7.1
N	MODULAR COMPUTER SYS	6- 9	8 7/8	0	0.0
N	MOHAWK DATA SCI	1- 13	3 3/8	+1/4	+8.0
N	NBI INC	11- 20	12 1/4	+1/8	+1.0
N	NCR	25- 52	52	+1 7/8	+3.7
N	PERKIN-ELMER	22- 36	33 1/4	+1 1/8	+3.5
N	PRIME COMPUTER INC	15- 27	21 1/4	-3/8	-1.7
N	SPERRY CORP	39- 70	70 3/8	+15 3/8	+27.9
O	STRATUS COMPUTER INC	9- 25	22 3/4	+1/2	+2.2
O	TANDEM COMPUTERS INC	13- 32	31 7/8	+7/8	+2.8
N	TANDY CORP	24- 44	39	+1/2	+1.2
O	TELEVIDEO SYSTEMS	2- 4	3 3/4	+1/8	-3.2
O	TELXON CORP	10- 32	32 1/4	+1 3/4	+5.7
N	TEXAS INSTRUMENTS	86- 141	136 3/4	-2 1/4	-1.6
A	ULTIMATE CORP	8- 32	30 3/4	-1/8	-0.4
O	VECTOR GRAPHICS INC	1- 1	1/8	0	0.0
A	WANG LABS "B"	15- 29	17 5/8	-1 1/2	-7.8
A	WANG LABS "C"	15- 29	17 3/4	-1/4	-1.3
N	XEROX CORP	37- 72	59 5/8	-3/8	-0.6

SUPPLIES & ACCESSORIES

EXCH		52-WEEK RANGE (1)	CLOSE MAY 7 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	21- 38	35 1/4	-1 1/8	-3.0
N	BARRY WRIGHT	17- 29	23 1/2	+1/4	+1.0
A	DUPLEX PRODUCTS INC	13- 22	21 1/4	-1/4	-1.1
N	ENNIS BUS. FORMS	14- 28	23 1/4	0	0.0
N	3M COMPANY	74- 107	101 1/4	-3 1/2	-3.3
N	MOORE CORP LTD	15- 27	25 1/2	-1	-3.7
O	STANDARD REGISTER	22- 45	41 1/4	-1/2	-1.1
N	WALLACE COMP SERVICE	30- 48	47 5/8	+1/4	+0.5

SOFTWARE & DP SERVICES

EXCH		52-WEEK RANGE (1)	CLOSE MAY 7 1986	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	2- 6	5 1/2	+3/8	+7.3
N	ADVANCED SYSTEMS INC	9- 20	16 1/2	-1 1/8	-6.3
N	AGS COMPUTERS INC	10- 25	20 1/2	-1 3/4	-7.8
O	AMERICAN SOFTWARE	9- 15	12 3/8	+1 5/8	+15.1
N	ANACOMP INC	2- 6	5 5/8	-1/4	-4.2
O	ANALYSTS INTL CORP	5- 11	6 3/4	0	0.0
O	ASHTON TATE	6- 28	28 1/8	+1 5/8	+6.1
O	ASK COMPUTER SYSTEMS	7- 25	12 1/4	-1 1/4	-9.2
B	ASTRADYNE COMP IND	1- 3	1 3/4	0	0.0
N	AUTOMATIC DATA PROC	35- 71	70 1/2	+2 1/2	+3.6
O	COMPUTER NETWORK	5- 9	8	+1/2	+6.6
O	COMPUTER ASSOC INT'L	18- 42	41 3/4	-1/4	-0.5
O	COMPUTER HORIZONS	5- 11	13 3/8	+3/8	+2.8
N	COMPUTER SCIENCES	13- 36	34 1/4	-3/4	-2.1
O	COMPUTER TASK GROUP	10- 28	26 1/2	-1 1/2	-5.3
O	COMPUTER USAGE	1- 3	2 3/4	+1/4	+10.0
O	COMPUTONE SYSTEMS	3- 11	5 1/4	+1/8	+2.4
O	COMSERV CORP	1- 6	3 1/2	-3/8	-9.6
O	COMSHARE	7- 12	10 5/8	-1/8	-1.1
N	CULLINET SOFTWARE	12- 33	14 1/8	+1/8	+0.8
O	CYCARE SYSTEMS INC	13- 27	13 3/8	-1/8	-0.9
O	HOGAN SYSTEM INC	4- 12	10 3/4	+1/2	+4.8
N	GENERAL ELECTRIC CO	56- 79	77 1/4	-7/8	-1.1
N	GEN'L MOTORS E (EDS)	20- 48	47 5/8	+1/8	+0.2
N	GTE CORP	38- 54	50 1/8	-1/2	-0.9
O	INFORMATION SCIENCE	1- 5	3 1/8	0	0.0
O	INFOTRON SYSTEMS CP	13- 24	15 1/2	0	0.0
O	KEANE ASSOCIATES	10- 20	14 1/2	-1	-6.4
N	LOGICON	25- 43	35 1/4	-1/2	-1.3
O	LOTUS DEVELOPMENT CP	15- 36	35	-1/2	-1.4
O	MCI COMMUNICATIONS	7- 13	10 1/8	0	0.0
O	MNGT SCI AMER INC	7- 16	14	+1/8	+0.9
O	MATHEMATICAL APP GRP	1- 8	5/8	-1/4	-28.5
O	MICOM SYSTEMS INC	12- 35	16 1/4	-3/4	-4.4
O	MICROPRO INT'L CP	2- 4	2 1/2	-3/4	-24.5
O	NATIONAL DATA CORP	8- 24	23 3/8	+1/2	+2.1
O	ON-LINE SOFTWARE INT	4- 16	15 3/4	+2	+14.5
N	PANSOPHIC SYSTEMS	14- 34	34	+5/8	+1.8
N	PLANNING RESEARCH	11- 23	21 7/8	+5/8	+2.9
O	POLICY MGMT SYSTS CP	16- 36	20 3/4	+2 1/4	+12.1
O	PROGRAMMING & SYS	4- 10	8 3/4	0	0.0
O	REYNOLDS & REYNOLD	30- 65	30	-1/4	-0.8
O	SEI CORP	13- 27	23 1/2	-1	-4.0
O	SHARED MEDICAL SYST	26- 38	37 1/8	0	0.0
O	SCIENTIFIC COMPUTERS	4- 8	4 5/8	0	0.0
O	SOFTWARE AG	12- 22	18	+1 1/8	+6.6
N	URS CORP	10- 18	16 1/8	-3/4	-4.4
N	UCCEL	11- 20	19 7/8	-1/4	-1.2
O	VM SOFTWARE	17- 26	25 1/2	+1/4	+0.9

SEMICONDUCTORS

	N ADVANCED MICRO DEV	22 - 3	6 2 8	-3/8	-1.
3					
O	ADV'D SEMICONDUCTOR	7- 23	12 3/4	-1/4	-1.9
N	ANALOG DEVICES INC	14- 24	24	+1/4	+1.0
O	ANALOGIC CORP	11- 16	14 1/4	+1 3/4	+14.0
N	APPLIED MAGNETICS CP	9- 19	19	-1/4	-1.2
O	AVANTEK	18- 26	20 1/4	-1 1/2	-6.8
O	HADCO CORP	3- 7	5 1/4	+1/2	+10.5
O	INTEL CORP	21- 33	28 1/2	0	0.0
O	MICRO MASK INC	5- 12	5 7/8	0	0.0
N	MOTOROLA INC	26- 48	45 1/8	-1 1/4	-2.6
N	NAT'L SEMICONDUCTOR	10- 15	14 1/8	0	0.0
N	TERADYNE	17- 33	28 1/2	+1 1/8	+4.1

PERIPHERALS & SUBSYSTEMS

EXCH		52-WEEK RANGE (1)	CLOSE MAY 7 1986	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIONAL	3- 8	7 7/8	+1/8	+1.6
A	ANDERSON JACOBSON	2- 5	2 1/4	+1/8	+5.8
O	AST RESEARCH INC	7- 33	20 1/2	+1/2	+2.5
O	AUTO-TROL TECHNOLOGY	3- 13	5 1/2	+1/4	+4.7
O	AVANT-GARDE COMPUTNG	3- 21	4 3/8	+1/8	+2.9
O	BANCTEC INC	6- 12	11 7/8	+3/4	+6.7
O	BEEHIVE INT'L	1- 2	1/8	0	0.0
N	BOLT,BERANEK & NEW	20- 43	42 7/8	+3/4	+1.7
O	CAMBEX CORP	1- 3	1 1/2	+1/4	+20.0
N	CENTRONICS DATA COMP	3- 11	5 1/2	+1/8	+2.3
A	CETEC CORP	6- 9	7 7/8	-1/4	-3.0
A	COGNITRONICS	4- 7	5	-1/8	-2.4
N	COMPUGRAPHIC CORP	23- 36	23 1/2	+3/8	+1.6
O	COMPUTER TRANSCEIVER	0- 1	7/8	-1/16	-6.2
N	COMPUTERVISION CORP	9- 44	17 7/8	+1 1/2	+9.1
N	CONRAC CORP	12- 18	16 7/8	-5/8	-3.5
A	DATAPRODUCTS CORP	11- 20	16	+5/8	+4.0
A	DATARAM CORP	4- 16	16 1/8	+1	+6.6
O	DATA SWITCH CORP	4- 9	7 1/4	-1/4	-3.3
O	DATUM INC	5- 9	7 1/8	+3/4	+11.7
O	DECISION DATA COMPUT	10- 20	11 7/8	-1/4	-2.0
O	ENDATA, INC	2- 8	6 1/2	-1/8	-1.8
O	EVANS & SUTHERLAND	12- 27	26 3/8	0	0.0
O	GANDALF TECHNOLOGIES	5- 13	6 1/4	-1/4	-3.8
N	GEN'L DATA COMM IND	8- 21	13	+1 1/8	+9.4
N	HAZELTINE CORP	18- 30	18	-1/8	-0.6
O	ICOT CORP	3- 12	12 3/8	0	0.0
O	INFORMATION INTL INC	10- 17	15	+1 1/4	+9.0
O	INTECOM INC	3- 11	3 7/8	-1/4	-6.0
O	MEGADATA CORP	3- 8	2 7/8	-1/8	-5.9
A	MSI DATA CORP	7- 13	12 3/4	+1/8	+0.9
N	NASHUA CORP	24- 52	50 5/8	-1/8	-0.2
O	NETWORK SYSTEMS CORP	11- 27	14 5/8	+3/4	+5.4
N	NO AMERICAN PHILIPS	32- 47	44	-1	-2.2
N	NORTHERN TELECOM LTD	26- 41	30 1/4	0	0.0
O	OMEX	1- 3	1/4	-1/8	-33.3
N	PARADYNE CORP	6- 18	9 1/4	+3/4	+8.8
A	PENRIL CORP	7- 14	7 1/4	-3/8	-4.9
N	PLESSEY CO (ADR)	19- 38	34	-3 1/2	-9.3
O	PRINTRONIX INC	9- 18	13 1/8	-1/4	-1.8
O	QMS INC	6- 16	12 3/8	+1/8	+1.0
O	RAMTEK CORP	2- 7	4 5/8	+3/8	+8.8
N	RECOGNITION EQUIP	9- 17	14	+1/4	+1.8
N	SANDERS ASSOCIATES	30- 44	32	+1/2	+1.5
O	SCAN-TRON CORP	9- 22	18 1/4	-1/2	-2.6
N	SCIENTIFIC ATLANTA	10- 15	11 3/8	+3/8	+3.4
O	SEAGATE TECHNOLOGY	5- 13	12 3/4	+3/4	+6.2
N	STORAGE TECHNOLOGY	1- 5	4	0	0.0
O	SYKES DATATRONICS	0- 2	3/8	0	0.0
A	T BAR INC	5- 9	6 1/8	-1/8	-2.0
A	TAB PRODUCTS CO	14- 23	21 1/8	+1/8	+0.5
N	TANDON CORP	3- 9	6 5/8	+3/4	+12.7
A	TEC INC	6- 13	5 5/8	-3/8	-6.2
N	TEKTRONIX INC	47- 68	59 3/4	+1 1/4	+2.1
N	TELEX	34- 68	63	+2	+3.2
O	TESDATA SYSTEMS CP	0- 3	5/8	0	0.0
N	TIMEPLEX INC	15- 23	17 1/8	+1/4	+1.4
N	TITAN CORP	4- 11	10 1/8	-3/8	-3.5
O	VISUAL TECHNOLOGY	1- 3	5/8	0	0.0

LEASING COMPANIES

EXCH		52-WEEK RANGE (1)	CLOSE MAY 7 1986	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMDISCO INC	7- 24	23 3/8	+1 1/8	+5.0
N	CONTINENTAL INFO SYS	5- 21	21	+3/8	+1.8
O	FINALCO GROUP INC	4- 5	4	-1/8	-3.0
O	PHOENIX AMERICAN INC	2- 6	4 5/8	-1/4	-5.1
O	SELECTERM INC	6- 12	11	+3 1/2	+46.6
N	U.S. LEASING	32- 46	41 3/4	-1 1/4	-2.9

EXCH: N—NEW YORK; A—AMERICAN; P—PACIFIC; B—BOSTON; L—NATIONAL; M—MIDWEST; O—OVER-THE-COUNTER; S—SPLIT

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Source: Trade Quotes, Inc.

COMPUTER INDUSTRY

INSIDE

Systems vendors are increasingly turning to independent chip makers for application-specific chip manufacturing/**162**

Sequent inks another big OEM deal/**166**

Apple Computer has entered the venture capital business/**168**

IBM will sell Hogan Systems banking software in a landmark OEM agreement/**188**

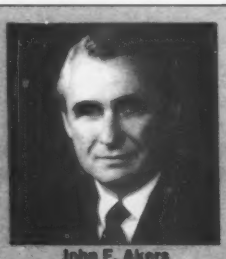
INSTANT ANALYSIS

"It has been said that prosperity is a great teacher and that adversity is an even greater teacher. As far as Control Data is concerned, I can vouch for that."

— Robert M. Price, chairman, president and CEO, Control Data Corp.

Akers, Olson: Industry's heirs apparent

Loyal IBM, AT&T executives' climbs end at the top of the corporate ladder



John F. Akers

AGE: 51

EDUCATION: B.S., Yale University

POSITIONS HELD: IBM sales trainee, 1960; various marketing positions; district manager; branch manager; administrative assistant to ex-President Frank T. Cary; vice-president, Data Processing Division, 1973; president, DP Division, 1974; corporate vice-president, 1976; group executive, DP Marketing, 1978; group executive, Info Systems & Communications Group, 1981; president, 1983; chief executive officer, 1985; chairman, June 1, 1986.

CORPORATE DIRECTORSHIPS: *The New York Times*

OTHER AFFILIATIONS: Metropolitan Museum of Art; California Institute of Technology; Advisory Board, Yale School of Organization & Management; Board of Governors, United Way.

PASTIMES: Tennis, golf and skiing

RESIDENCE: Westport, Conn.

By Alan Alper

As retirement creeps up on AT&T Chairman Charles Brown and IBM Chairman John Opel and new leadership is poised to take the computer and communications behemoths into the next decade, it is clear that each man has selected a successor cut from his firm's corporate cloth.

Both successors, IBM President and Chief Executive Officer John F. Akers and AT&T President and Chief Operating Officer James E. Olson, will inherit the reins of the only corporations for which they have ever worked. Akers, 51, will become IBM chairman June 1; Olson, 60, although not yet officially named by AT&T, is unanimously considered by observers to be the successor when Brown retires in August.

Both men began at the entry level — Olson in 1943 as a splicer's assistant at Northwestern Bell, Akers in 1960 as a sales trainee in IBM's San Francisco office. Both have climbed the corporate ladder rung by rung to reach the top.

Akers has followed the typical IBM chairman's progression through the sales and marketing ranks, gaining experience in managing a variety of IBM businesses before arriving in the corporate suite. Olson also covered the traditional bases throughout the Bell system, taking the helm of a number of telephone companies before becoming AT&T president and chief operating officer last June.

Few IBM watchers expect dramatic changes to unfold as Akers assumes the chairmanship from Opel, despite the firm's current financial malaise. "Things at IBM are done on more of an evolutionary basis," says ex-Businessland, Inc. President Ronald Watkins, a former IBM executive who worked closely with Akers at several levels.

However, when Olson is chosen by AT&T's board, observers expect massive changes to ensue — and fast. Yet because of his age and AT&T's mandatory retirement age of 65, some analysts view Olson as an interim leader, one who will make AT&T a leaner corporation before making way for a more marketing-oriented chairman.

"Olson will streamline the organization, and then someone from the second tier of the orga-

See **INDUSTRY** page 164

James E. Olson

AGE: 60

EDUCATION: B.S.C., University of North Dakota; University of Pennsylvania Institute of Humanistic Studies.

POSITIONS HELD: Splicer's assistant, Northwestern Bell, 1943; district traffic supervisor, Northwestern Bell, 1951; AT&T O&E-Traffic Division, 1958; vice-president, general manager, Nebraska area, Northwestern Bell, 1964; president, Indiana Bell, 1972; president, Illinois Bell, 1974; executive VP, AT&T, 1977; president, chief operating officer, AT&T, 1985; chairman, AT&T, August 1986(?).

CORPORATE DIRECTORSHIPS: Borg-Warner Corp.; Chase Manhattan Corp.; Jewel Cos.

OTHER AFFILIATIONS: University of Chicago Graduate School of Business; Joint Council on Economic Education.

PASTIMES: Golf and fishing

RESIDENCE: Short Hills, N.J.

Datapoint's expected return to black halts buyout proposal

By James A. Martin

SAN ANTONIO — The investment group led by New York financier Asher B. Edelman last week terminated its leveraged-buyout proposal for Datapoint Corp. as a result of that company's anticipated return to profitability, Edelman said.

"While the terms of the buyout were found to be fair at the time they were proposed, and although the investment bankers to the buyout group have advised me of their ability to raise the financing for the transaction, recent improvements in Datapoint's results and prospects have caused me to conclude that the proposal should be terminated," Edelman said in a prepared statement.

Edelman will remain chairman of Datapoint, with no changes expected as a result of the buyout termination, President and Chief Executive Officer Edward P. Gistaro said. "The only thing it changes is to remove the uncertainty about whether the company will be private or remain public," Gistaro told *Computerworld*.

Datapoint's customers are most likely pleased to see the company remain public, since public companies are required to provide detailed financial and corporate information, speculated William C. Rosser, a vice-president of the Gartner Group, Inc. in Stamford, Conn.

"If that's the end of the story, then Datapoint can get back to doing what they should be doing and will be less distracted by all that grief," Rosser said.

Edelman became chairman of Datapoint last year after his successful hostile takeover of the computer firm. In September 1985 Edelman's investment group made its leveraged-buyout offer of $6 a share for 17

See **DATAPOINT** page 188

Microcomputer exhibits at Comdex betray signs of middle-age blahs

INDUSTRY INSIGHT
Clinton Wilder

Keynote speaker Robert Dilworth of Zenith Data Systems spoke of succeeding by selling personal computers like commodity TV sets; the consensus prediction was that only firms with significant corporate "muscle" will prosper; and at booth after Comdex booth, the tune was "not much excitement — strictly business."

Welcome to the microcomputer industry, circa spring 1986.

"Micro software is in a holding pattern," Craig Stinson of the Seybold Group, Inc. declared after surveying the first 1½ days of the recent Comdex/Spring '86 extravaganza in Atlanta.

"All the new products are basically accessory — products that make other products run better. Major applications are showing all the signs of a shakeout in a mature industry," he added.

Though you would not know it from reading a curious piece of fiction known as *The Interface Group's Comdex Show Daily*, the micro software, hardware and peripherals industries are growing up. That's no secret, and it was certainly evident well before last month's annual spring pilgrimage to the sunny skies of Georgia.

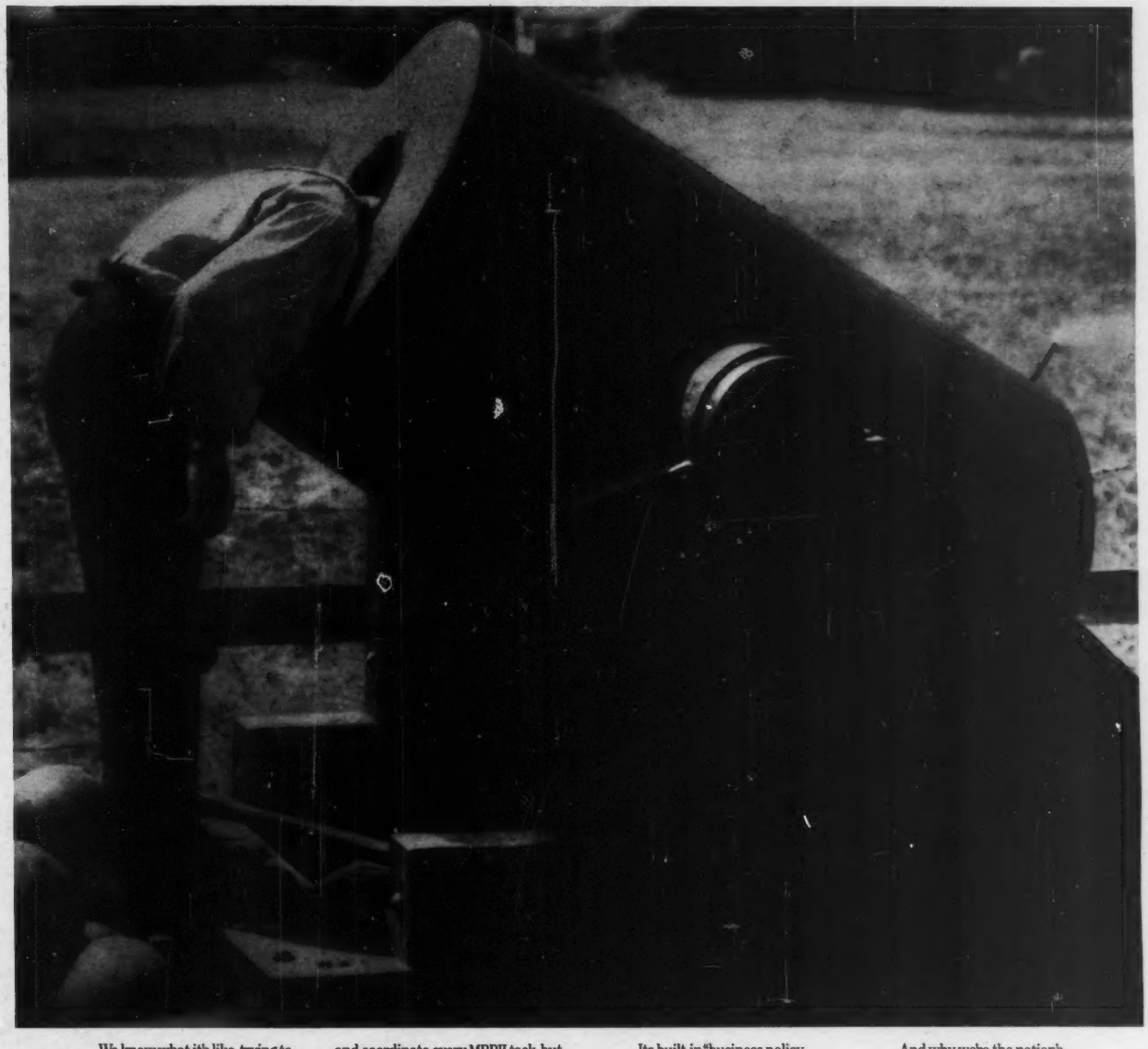
But that maturity, as inevitable as it might have been, brought a certain blandness to Comdex/Spring that would have been unthinkable at the industry's trade showcases a very short time ago.

Instead of extolling the merits of the latest breakthrough in presentation graphics or microprocessing power, Comdex panelists fought over cutthroat "mail order" pricing of commodity spreadsheet packages and IBM Personal Computer AT clones. Comdex has been known as the show where hype and hot products reign supreme. But in Atlanta, notwithstanding Televideo Systems, Inc.'s live Bengal tiger, it

See **MICRO** page 166

Wilder is Computerworld*'s senior editor, computer industry.*

So it's your job to find that one factory management system that will satisfy everyone in the company.



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Every purchasing agent.

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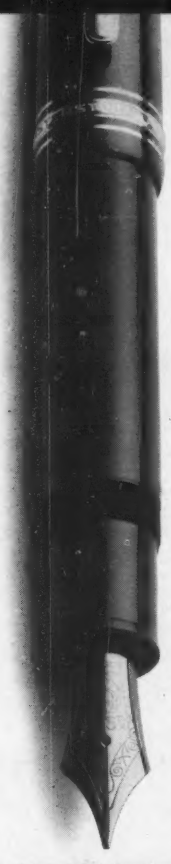

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